CONTROL OF DERMATOPHILOSIS OF RUMINANTS IN THE TROPICS

Partner : IRZV Cameroon,

Centre de Recherches Zootechniques et Vétérinaires de Wakwa

YEARLY REPORT

1993

December 1993

ADMINISTRATIVE AND FINANCIAL REPORT

The sub-contract between CRZV Wakwa and RVC London was signed in April 1993. The administrative officer of the Cameroonian side, Dr D.A.MBAH, was transferred to Yaounde in July 1993 and was replaced at the head of the Centre de Recherches Zootechniques et Vétérinaires de Wakwa by Dr V.N.TANYA, who is now acting as the new administrative officer.

The first part of the grant was received in July by Dr F.STACHURSKI. The amount of this credit transfer, corresponding to 1,350 ecu, was 8,692 FF as shown by the enclosed copy of the bank statement, which had also been sent to Mr BLENNERHASSET in November. This indicates that the exchange rate between ecu and french franc is 6.4385 FF for one ecu, and that the 1993 budget of the cameroonian partner was 482,889 FCFA, corresponding to 1,500 ecu. There are two chapters in this budget, "Travel and Subsistance" (500 ecu i.e. 160,963 FCFA) and "Other Expenditure" (1,000 ecu i.e. 321,926 FCFA). Dr SASIAK was asked, in August, if the budget of 1992, of which not a single franc was spent because of the delay required to finalize and sign the sub-contract, could be used in 1993. The same question was asked Mr BLENNERHASSET in November. As no answer was received, only the 1993 budget was spent. But, as much of the work was done on-sattion and id not require a lot of travelling, it did not impair the realisation of the Project. Other questions dealing with the way in which the cost statements have to be presented, the possibility of paying phone bills, herdsmen allowances, stamps, and buying diesel fuel in advance (and to receive credit notes in exchange) also remained unanswered. As no precision was given about the way the bills have to be presented, it was decided to do as with the "Cowdriosis project" and to send to the RVC the original bills with the signatures of the administrative and scientific officers and to keep in Wakwa certified copies of the bills.

The details of the cost statements are presented in an annexed table : 463,055 FCFA were spent in 1993, 156,270 of this for the chapter "Travel and Subsistance" and 306,785 for the chapter "Other Expenditure" (which was also considered as "Consumables" because of the need to buy laboratory material, drugs and stationary for the Project).

SCIENTIFIC REPORT

I. COLLECTION OF SAMPLES FOR STUDIES ON THE GENETIC MARKERS OF CATTLE RESISTANCE TO DERMATOPHILOSIS.

The task of the Cameroonian partner has always been defined as **to identify cattle resistant or susceptible to the dermatophilosis, and to provide samples from these animals for genetic studies**. The way the samples had to be collected remained for a long time unclear, until the following precisions were received in May from CIRAD-EMVT Guadeloupe (J.C.MAILLARD) :

- need of about 40 samples of Gudali cattle : 20 from resistant animals and 20 from sensitive ones, all non-related ;
- take of 10 ml of blood from each animal and extraction of the buffy coats which have to be kept in urea buffer and in a fridge until their expedition to Guadeloupe is possible.

From discussions with local officials of the Livestock Ministry, it appeared that dermatophilosis, which caused very important losses amongst cattle in 1989 and 1990, is now a much less serious problem. The reason is that the extension services have explained to the farmers the relationship between dermatophilosis and the tick *Amblyomma variegatum*, and also that tick control could control the disease. Many of the cattle owners subsequently bought manual sprayers and acaricides, especially pyrethroids, and are now spraying their animals regularly during the rainy season. The importance of the disease seems to have consequently decreased spectacularly.

For these reasons, it was decided to first collect samples on the zebus of the Research Centre, where dermatophilosis remains very important because of the poor tick control carried out for two to three years (causes : lack of funds to buy acaricides regularly and lack of motivation of the herdsmen who have no salary for months). Some other samples were collected on animals bought in bush markets and passing in transit in Ngaoundere before being convoyed by train to Yaounde and Douala for slaughter. Some samples were also collected from a herd belonging to the Lamido of Ngaoundere, the tradidionnal Muslim chief. There were many cases of dermatophilosis in this herd.

CRZV Wakwa :

The samples were collected between 15 and 27 July. All the animals of the Centre were examined and blood was taken from those which could be considered as "Resistant" or "Sensitive" to dermatophilosis. Those regarded as resistant were old animals (10 of the 12 samples are from cows older than 10 years, see Table I) on which the herdsmen have never seen dermatophilosis lesions, and which were not reported in the clinical books to have been treated against dermatophilosis. Their origin is unknown but most of these resistant cattle were bought 10 years ago in the whole Province of Adamawa, and there is very little chance that they are related.

As stated above, the disease is a real problem in the Research Centre. Each year, more than 10 animals die or are slaughtered or sold because of it. For this reason, the most sensitive of the old animals (more than 5 years) have disappeared from the herds. That is why the sensitive animals were rather chosen amongst the youg ones (less than 3 years), although blood was also collected from some older animals. Most of those latter cows already had lesions in 1992, and it appeared from the data that they have almost all their dam or descendants affected by dermatophilosis (see table II). Cases of dermatophilosis were assessed from * (small lesions on the back) to **** (important lesions on the back, around anus and vulva, and on the legs).

The breeding data of the Centre were examined after the blood collections, and it appeared that there were 5 pairs of cow-calf amongst the samples. In three cases, the cows (8, 12 and 12 years old) were resistant to the dermatophilosis and their calves (2 to 3 years old), carrying lesions were regarded as sensitive. Two of these 3 calves had the same sire. Although it was specified that the selected animals had to be non-related, the samples of these six animals were kept : it is perhaps helpful to study blood from calves which have a behaviour different from that of their dams towards dermatophilosis. In the two other cases, the calf and its dam were equally sensitive to the disease, and only the calf sample was included in the study. Similarly, two other samples were excluded from the study because the animals were related with another zebu whose blood was also collected.

Table I : Informations on cattle resistant to dermatophilosis sampled in CRZV Wakwa.

sample number	sex	birth date	origin	dam	sire	susceptibility to dermatophilosis	attractivity for A.variegatum	Supplementary informations
570	F	around 1980	bought in 1982	unknown	unknown	resistant	variable	6 descendants : 5 dead (none reported because of D), 1 living unaffected by D
9184	F	around 1980	bought in 1982	unknown	unknown	resistant	average high	6 descendants : 3 dead (none reported because of D), 3 living unaffected by D
73	F	around 1981	bought in 1982	unknown	unknown	resistant	variable	6 descendants : 5 dead (2 crossbred because of D), 1 living unaffected by D
9148	F	around 1981	bought in 1982	unknown	unknown	resistant	average low	5 descendants : 3 without offtake informations, 2 living affected by D (90 074 sampled)
88	F	around 1981	bought in 1983	unknown	unknown	resistant	very high	6 descendants : 3 dead (none reported because of D), 2 sold, 1 living unaffected by D
9407	F	around 1981	bought in 1983	unknown	unknown	resistant	average	2 descendants : 1 without offtake informations, 1 dead (not reported because of D)
569	F	around 1981	bought in 1983	unknown	unknown	resistant	high	4 desc.: 2 dead (none reported because of D), 1 without o.i., 1 living unaffected by D
9429	F	around 1981	bought in 1983	unknown	unknown	resistant	average low	7 descendants : 4 dead (none reported because of D), 1 sold, 2 without o.i.
52	F	around 1981	bought in 1984	unknown	unknown	resistant	low	3 descendants, all without offtake informations
9984	F	around 1981	bought in 1984	unknown	unknown	resistant	average	6 desc.: 3 dead (none reported because of D), 2 living (90 065 affected by D, sampled)
85 557	F	15/03/85	born in Wakwa	84 051	unknown	resistant	average low	3 descendants dead, dam dead, none because of D
568	F	02/06/85	born in Wakwa	84 029	unknown	resistant	low	2 descendants living (91 104 affected by D, sampled)

D : dermatophilosis
desc. : descendants
without o.i. : without offtake informations (impossible to find why and when the animal disappeared from the herds)

Table II : Informations on cattle sensitive to dermatophilosis sampled in CRZV Wakwa.

sample number	sex	birth date	origin	dam	sire	susceptibility to dermatophilosis	attractivity for A.variegatum	Supplementary informations
84 047	F	around 1982	bought in 1984	unknown	unknown	93:***	average	4 descendants : 2 without offtake informations, 2 living whose 1 affected by D (*)
85 125	F	around 1983	bought in 1985	unknown	unknown	93:**	average low	3 descendants : 2 dead whose 1 slaughtered because of D, 1 living unaffected by D
90	F	11/08/85	born in Wakwa	9909	unknown	92:**;93:***	low	slaughtered 5 days later; 2 desc. living (1 aff. by D); dam slaughtered because of D
86	F	04/06/85	born in Wakwa	84 009	unknown	92:**;93:**	high	2 descendants living, unaffected by D ; dam without offtake informations
85 642	F	27/06/85	born in Wakwa	9486	unknown	93:***	average	2 descendants living, unaffected by D ; dam slaughtered because of D
86 069	F	02/03/86	born in Wakwa	84 085	8397	93:***	average	2 desc.: 1 dead when 10 months old because of D, the other and the dam unaffected by D
86 409	F	02/07/86	born in Wakwa	84 044	7779	92:**;93:**	average low	2 descendants without offtake informations ; dam slaughtered not because of D
87 033	F	around 1985	bought in 1987	unknown	unknown	93:**	average	2 descendants : 1 dead (not because of D), 1 living affected by D (*)
566	F	26/03/87	born in Wakwa	9926	8962	92:*;93:**	low	1 descendant, living and unaffected by D ; dam slaughtered not because of D
90 065	F	14/04/90	born in Wakwa	9984	84 283	93:**	unknown	dam resistant to dermatophilosis
90 074	M	18/04/90	born in Wakwa	9148	84 283	93:**	unknown	dam resistant to dermatophilosis
90 131	M	02/06/90	born in Wakwa	84 461	6899	93:**	unknown	dam slaughtered because of D when 8 years old; no offtake inform. for its other calves
90 192	M	22/08/90	born in Wakwa	74	9716	92:**;93:**	unknown	dam (8 years) affected by D (*) ; no offtake informations for its other calves
91 055	F	06/04/91	born in Wakwa	85 646	unknown	92:**;93:***	unknown	dam without offtake informations
91 056	M	06/04/91	born in Wakwa	85 206	9067	93:**	unknown	dam slaughtered because of D when 6 years old
91 104	F	09/06/91	born in Wakwa	568	unknown	92:**;93:***	unknown	dam resistant to dermatophilosis
92 032	F	07/01/92	born in Wakwa	54	unknown	93:**	unknown	dam (8 years) affected by D in 92 (*) and in 93 (**)
216	M	12/09/92	born in Wakwa	84 075	unknown	93:**	unknown	dam living, unaffected by D
217	M	24/09/92	born in Wakwa	9400	unknown	93:**	unknown	dam living, unaffected by D
004	M	05/06/93	born in Wakwa	84 059	86 333	93:*	unknown	dam affected by D (**) ; its other calf (2 years) also affected by D (*)

D : dermatophilosis (the importance of the lesions is assessed from * to ****)

There were therefore 12 samples from resistant Gudali zebus and 20 from sensitive ones. The data concerning these animals are in Tables I and II. For the cows examined in 1992, the attractivity for *A.variegatum* is mentioned. This characteristic is assessed by the calculation of the infestation degree (ID), which is the ratio between the infestation of the animal considered and the mean infestation of the herd in which it was kept. A low attractivity means that the infestation of the zebu was about half that of the herd ; a high attractivity indicates that the animal's infestation was about twice that of the herd. The attractivity is variable when the ID is very different from one tick count to the other.

From the tables, it seems that there is little correlation between the attractivity for *A.variegatum* and the sensitivity to dermatophilosis. But it has to be kept in mind that the most sensitive zebus of the Centre, older than three years, have already been slaughtered because of severe dermatophilosis. Four of the cows selected in June 1992 for their high attractivity died during the following months (see tables V and VI showing the evolution of the disease in the two herds used in the study of the heritability of the attractivity - "Cowdriosis and its Vectors Project" -). The blood of these cows was not collected because of the absence of precisions concerning the way the samples had to be collected at the time.

<u>Cattle passing in transit in Ngaoundere</u> :

On Thursday evenings, about 300 to 400 cattle, bought during the week by traders in the various bush cattle markets usually arrive at Ngaoundere. On Friday mornings, they are examined and marked by the agents of the Provincial Livestock Service, before being put in the train for Yaounde and Douala where they are slaughtered.

As already stated above, dermatophilosis is no longer an important disease for the cattle owners of the Province, and only few cases were seen on these animals. Nevertheless, 7 samples were collected on 5 and 12 July on animals regarded as sensitive. The characteristics of these zebus are mentioned on the table III. It was impossible to determine, amongst all the animals without lesions, which were those really resistant and those which were not exposed to the disease. Therefore, no resistant cattle could be identified.

Table III : Informations on cattle sensitive to dermatophilosis sampled in Ngaoundere.

sample number	sex	Approximate age	Importance of the lesions	Market of origin
1	F	3 years	**	Tello
2	F	3 years	*	Tello
3	F	4 years	*	Likok
4	M	4 years	**	Tello
5	M	4 years	**	Belel
6	F	2 years	**	Tello
7	F	6 years	**	Tello

* : few lesions on the back
** : important lesions on the back, other parts of the body unaffected

Herd of the Lamido of Ngaoundere :

During the sample collection in Ngaoundere, it was heard that there were numerous cases of dermatophilosis in a herd of the Lamido grazing in Lahore Vina, 10 kilometers away from Wakwa. A visit was made on 14 August with a veterinary assistant of the Livestock Ministry. Five samples were collected on sensitive animals.

Table IV : Informations on cattle sensitive to dermatophilosis sampled in Lamido's herd.

sample number	Sex	Approx. age	Importance of lesions	Supplementary informations
8	F	4 years	***	its calf (1 year): dermato. ***
9	F	4 years	***	
10	F	1 year	**	its dam slaughtered for dermato.
11	F	5 years	**	
12	M	1 year	**	

** : important lesions on the back, other parts of the body unaffected
*** : very important lesions on the back, presence of lesions around anus and vulva and on the legs

The cattle of this herd were bought 18 months ago in the ranch of Sodepa, a state company where tick control is implemented by dipping. Since they arrived at Lamido's farm, tick control tick has not been correctly done. This could explain the outbreak of dermatophilosis.

But all cattle did not suffer from the disease. At the end of the rainy season, on 9 November, a second visit was made in order to identify resistant animals. Three samples were collected from cows apparently older than 6 years which never had lesions (number A, B and C).

All the samples except the three collected in November in the Lamido's herd were taken in August to CIRAD-EMVT Maisons-Alfort so that J.C.MAILLARD could take them before flying back to Guadeloupe after his leave. The 3 other samples will be sent later.

In 1989-1990, concurrently with the development of tick control by manual sprayers, the Provincial Livestock Services carried out a survey in some abattoirs of the Province to determine the importance of dermatophilosis. This survey was never analysed but the data are still available. The Provincial Delegate has given the authorization to look at these data. It will be done in the next weeks. A new survey could also perhaps be set up in the same conditions to estimate the evolution of the disease.

In addition, identification of herds in which dermatophilosis is still responsible for many clinical cases, slaughtering and deaths will be implemented in 1994 around Ngaoundere in order to to have more samples for resistant animals.

II. EVOLUTION OF DERMATOPHILOSIS IN THE HERDS WHERE THE HEREDITY OF ATTRACTIVITY FOR *A.VARIEGATUM* IS STUDIED

The two herds (E1 and E3) of this study, component of the STD3 Project "Réseau de Recherches sur la Cowdriose et ses Vecteurs", were constituted on 20 June 1992 with cows chosen in all the herds of Wakwa Centre for their attractivity (high or low) for *A.variegatum* (the way this characteristic was assessed is explained on page 4 of the present report).

Each time the cattle were weighed (once a month) and on some other occasions (when they were treated with Bayticol® pour-on for example), the animals were checked. Tables V and VI indicate the results of this observation. For each date and each animal, are mentioned the presence of dermatophilosis lesions (whose importance is assessed from * to ****), the eventual treatment with Extencilline® (penicilline G long-action and sole antibiotic available at the time) and if scabs were collected on the animals. These scabs are now stored in CIRAD-EMVT Maisons-Alfort and are at the disposal of people who want to study them (initially they were collected for Daniel FAIBRA, researcher of Farcha working in Maisons-Alfort).

At the time of the constitution of the herds, 9 zebus were more or less affected by dermatophilosis. Four others became affected before the end of the year. Ten of these 13 animals had a high attractivity for *A.variegatum*.

From the 13 affected zebus, 5 were slaughtered because of persistent dermatophilosis or general weakness resulting from the disease. Seven again had lesions in 1993. Only one of the animals affected in 1992 had no relapse in 1993. During that year, four new cases of dermatophilosis were observed, one on a calf, two on cows very attractive for the tick and the last on a cow with a low attractivity for *A.variegatum*. At the time of the last examination of the herd, on 15 december, five animals still had lesions of dermatophilosis. They will be treated again before the beginning of the rainy season.

Wakwa, 31 December 1993

The administrative officer

Dr V.N.TANYA

The scientific officer

Dr F.STACHURSKI

Table V : Evolution of dermatophilosis in herd E1.

animal number	sex	birth date	attractivity for A.variegatum	20/06/92		20/07/92		8/10/92		15/11/92		22/03/93			19/04	29/04/93		13/05/93			27/05/93			14/06/93			28/06/93			15/07/93			30/07/93		13/08/93			15/09/93		15/11	15/12
				D	E	D	E	D	E	D	E	D	E	S	D	D	E	D	E	S	D	E	S	D	E	S	D	E	S	D	E	S	D	E	D	E	S	D	E	D	D
13	M	19/03/87	low																																						
9196	F	around 1980	high																																						
20	F	around 1985	high																																						*
53	F	around 1985	low																																						
54	F	03/05/85	high	*	15 ml	*	15 ml								*	*		**	20 ml		*			*			*			*		S	*								*
55	F	09/03/87	low																																						
56	F	08/04/87	low																																						
71	F	25/05/87	low																																						
72	F	09/03/86	low																																						
73	F	1981	variable																																						
74	F	20/03/85	high												*	*		**	20 ml	S	*			*		S	**	20 ml		**	20 ml	S	*		**	30 ml	S	***	30 ml	*	
75	F	1984	low																																						
76	F	30/03/86	high																																						
77	F	04/07/85	low					**	20 ml												*			*		S	*			*			*	15 ml						*
78	F	22/03/87	low																																						
79	F	03/10/87	high																																						
80	F	29/06/85	high	*	15 ml	**	4x20 ml	**	15 ml	**	2x15 ml	Slaughtered on 15/12/92 because of persistent dermatophilosis																													
81	F	09/04/85	high																																Slaughtered on 15/07 (blocked teats, no milk)						
82	F	07/03/86	low																																						
83	F	1982	low																																						
84	F	1981	low																											*	15 ml		*						*		
85	F	1981	low																																						
86	F	04/06/85	high	**	20 ml	**	2x15 ml	*		*		**	20 ml	S	*	*		*			*			*			*			**	20 ml	S	*		**	30 ml	S				
87	F	1985	low	Found dead on 26/02/93 in a swampy pasture																																					
88	F	1981	high																																						
90	F	11/08/85	low	**	20 ml	*	2x15 ml	**	2x20 ml	*		**	20 ml	S	*	**	20 ml	*	20 ml	S	*	20 ml	S	**	20 ml	S	***	30 ml	S	**				Slaughtered on 20/07 (persistent dermato.)							
217	M	24/09/92	unknown	The dam is the cow 84																				*			**	10 ml		*			*		**	12 ml	S				

D : importance of the dermatophilosis lesions, assessed from * to ****
E : treatment with Extencilline(R)
2x15 ml : 2 injections of 15 ml at 4 days interval
S : scabs collected

Table VI : Evolution of dermatophilosis in herd E3.

animal number	sex	birth date	attractivity for A.variegatum	20/06/92		20/07/92		08/10/92		15/11	22/03/93			19/04	29/04	13/05/93			27/05		14/06	28/06/93		15/07/93			30/07	13/08/93			15/09	15/11	15/12
				D	E	D	E	D	E	D	D	E	S	D	D	D	E	S	D	S	D	D	E	D	E	S	D	D	E	S	D	D	D
19	M	19/03/86	high					*	15 ml					*	*																		
52	F	around 1981	low																														
551	F	01/04/87	low																														
552	F	11/03/87	low																														
553	F	03/10/87	high	** 15 ml		** 2x20 ml		** 2x20 ml		**	Slaughtered on 16/11/92 because of persistent dermatophilosis																						
554	F	11/04/87	low																														
555	F	29/06/85	high																														
556	F	23/03/86	high	** 20 ml		Slaughtered on 07/07/92 after					prolonged recumbency																						
557	F	around 1981	high	*		** 20 ml		*		*	Slaughtered on 04/12/92 because of general weakness due to persistent dermatophilosis																						
558	F	23/03/87	high					*	15 ml							*								*	15 ml	S	*	*	20 ml	S		*	
559	F	01/04/87	high																														
563	F	27/03/86	low																														
564	F	05/04/87	high			* 2x15 ml					* 15 ml	S															*	*	20 ml	S		*	*
565	F	08/04/87	variable																														
566	F	26/03/87	low	* 15 m				* 10 ml			* 15 ml	S			*	*	20 ml	S	*	S	*	** 20 ml		* 15 ml			*	*	20 ml	S	*	*	*
567	F	01/05/85	high																														
568	F	02/06/85	low																														
569	F	around 1981	high																														
570	F	around 1980	variable																														
571	F	around 1984	high																														
572	F	around 1984	high																														
573	F	around 1984	low																														
574	F	13/04/88	low																														
575	F	around 1980	low								Found dead in a hole on 10/02/93																						
590	F	01/04/85	high	* 15 m		** 3x15ml																											
592	F	around 1980	high																														

D : importance of the dermatophilosis lesions, assessed from * to ****
E : treatment with Extencilline(R)
2x15 ml : 2 injections of 15 ml at 4 days interval
S : scabs collected

ANNEX

COST STATEMENTS

CIRAD-EMVT / CRZV WAKWA
F.STACHURSKI

SUB-CONTRACT FM-M6/-S003 TO CONTRACT N°: TS3*-CT91-0012

CONTROL OF DERMATOPHILOSIS OF RUMINANTS IN THE TROPICS
Cameroonian Partner

			CHAPTER : TRAVEL				CHAPTER : OTHER EXPENDITURE			
			FRANCS CFA		ECU		FRANCS CFA		ECU	
DATE	ACC. RECORD	OBJECT	AMOUNT	BALANCE	AMOUNT	BALANCE	AMOUNT	BALANCE	AMOUNT	BALANCE
		BUDGET 1993		160,963		500.00		321,926		1,000.00
12/08/93	1	Diesel fuel	7,000	153,963	21.74	478.26				
20/09/93	2	Urea (lab. material)					10,235	311,691	31.79	968.21
28/09/93	3	Laboratory material					104,930	206,761	325.94	642.26
05/11/93	4	Photocopies					10,000	196,761	31.06	611.20
08/11/93	5	Drugs					38,000	158,761	118.04	493.16
10/11/93	6	Diesel fuel	7,400	146,563	22.99	455.27				
11/11/93	7	Stationery					4,650	154,111	14.44	478.72
23/11/93	8	Diesel fuel	7,500	139,063	23.30	431.97				
03/12/93	9	Diesel fuel	8,100	130,963	25.16	406.81				
04/12/93	10	Diesel fuel	6,270	124,693	19.48	387.33				
17/12/93	11	Drugs					98,000	56,111	304.42	174.30
21/12/93	12	Phone calls for 1993					17,520	38,591	54.42	119.88
22/12/93	13	Ropes, stationery					11,600	26,991	36.03	83.84
22/12/93	14	Stamps					11,850	15,141	36.81	47.03
27/12/93	15	Credit notes for diesel fuel	120,000	4,693	372.76	14.58				