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Ministère de l 'Agriculture
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Laboratoire National de l 'Elevage et de
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United Nations
Food and Alimentation Organisation
F.A.O

Dr Yaya Thiongane,

TCDC Consultant, TCP/RAF/8821(E)

Rift Valley fever Surveillance in Kenya and Tanzania

Decem ber 1999

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FOOD AND AGRICULTURE
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F.A.O.

REPORT

Dr Yaya Thiongane, TCDC Consultant, TCP/RAF/8821(E)

Rift Valley Fever Surveillance in Kenya and Tanzania

December 1999

I. INTRODUCTION:

Rift Valley fever (RVF) is an acute, arthropod-borne viral disease of sheep, cattle and man in many areas of Africa including Egypt. The disease is characterised by a short incubation period, a definite but short febrile episode and focal to diffuse necrosis of liver. Early studies showed that the mortality rate is high among young animals like young lambs and calves and abortions are common in sheep and cattle.

Severe epizootic and epidemic manifestations have occurred during the past two decades in Africa. Epizootics are precursor manifestations of epidemics. In Livestock, RVF appears when infected mosquitoes bite susceptible hosts (Cattle, sheep, goats, camels,). Many mosquito species have been implicated as epizootic vectors. In East Africa, the spread of RVF is attributed to two subgenera of aedes mosquitoes: Aedimorphus and Neomelaniconion.

The human populations, living in close association with their animals appear to be most likely affected because they can be infected by direct contact with sick animals, theirs fœtus, excretions or infected tissues. The clinical picture for human disease ranges from febrile illness to fatal hemorrhagic fever, and late complications of encephalitis or ocular disease are associated with considerable human morbidity and mortality.

In East Africa, RVF epizootics have been related to rainfall. Annually flooded dambos are a favourable breeding site for mosquitoes. In West Africa and Egypt, they are more associated to agricultural developments following the construction of dams. In the Senegal River Basin, for example, the rural activities have been largely modified since the construction of dams: Diama in 1985 and Manantali in 1990 which permits the irrigation of extensive areas for rice production. The dams modified the water flow, attracted pastoralists and increased vector-borne diseases such as Rift valley fever in this sahelian zone.

According to the risk for livestock and human population, a surveillance network was established through sentinel herds after the 1987 epizootic in the Senegal river Basin. The objective of the network was to detect RVF cases by regularly conducting serological surveys in sentinel herds and human populations.

This sero-survey of RVF conducted in domestic ruminants in Senegal allows us to annually assess the risks for the non immune populations. It showed during a period of heavy rainfall (1994-1995) that RVF activity re-emerged as epizootics among herds in the lower Senegal River basin, attested by both the high prevalence of IgG and IgM. A specific RVF diagnosis was chosen with ELISA assay. Moreover, this diagnostic tool permits separation of IgG and IgM; and IgM are a valuable indicator of recent infections.

In East Africa, the 1997-1998 FVR epidemic was associated with heavy rains that be related to the El Nino event. From September 1997 to January 1998, the region received torrential rains resulting in flooding. Areas remained flooded for 3-6 months compared to 6 weeks in normal year. These effects were ideal conditions for breeding of insect vectors of animal and human diseases in Kenya, Tanzania and Somalia. Mosquitoes and other vectors appeared in numbers never seen before.

The presence of RVF was first observed in December 97 when hemorrhagic diseases was confirmed in people in the North-Easthern Kenya, Livestock losses up to 70% in goats and sheep, 20-30% in cattle and camels in the same areas. There were some delays in the confirmation of Rift valley fever in the affected areas. Many factors are responsible of this, such as the lack of diagnosis capacity of disease locally and slow disease reporting. So. The samples collected for confirmation of the disease were tested outside Kenya, in South Africa and in the U S.A.

After this epizootic, the TCP/RAF/8821(E) was initiated in order to develop the capacity for early warning including to strenghten surveillance activities in RVF prone areas of Kenya and Tanzania and to enhance the capacity for early laboratory diagnosis of Rift Valley fever.

The present study aims to meet one of the objectives of the project that is to establish an early warning system through sentinels herd located in areas considered at risk because they have faced the last RVF outbreak in 1997-1998 in Kenya and Tanzania. This system must be able to detect early signs of a probable epidemic of Rift Valley fever and permit to take control measures like vaccination and insect control.

II. GENERAL CONSIDERATIONS:

2.1. Livestock systems in East Africa

2.1.1. Kenya covered a area of 580,367 km2. The livestock population is estimated as 12 million cattle, 8 million sheep and 10 million goats. Farming systems include pastoralism and mixed farming.

The control and the eradication of all animal diseases including zoonoses and diseases vectors are the responsibility of the Department of Veterinary Service (D.V.S) of the Ministry of Agriculture. Diagnostic investigations for the whole country were done in the Central Veterinary laboratory in Kabete and five regional laboratories (named Veterinary investigation Laboratory or V.I.L).

Considered as notifiable disease, RVF is endemic in Kenya and regular vaccinations are carried out in exotic and grade animals. The last RVF outbreak, consecutive to excessive rains and floods in 1997-1998, has been reported in Kenya's North-eastern, Rift valley, Central and Coastal Provinces. These areas include some national parks. The RVF vaccine consumption in 1998 was the highest during the last ten years (see annexe X).

2.1.2. Tanzania is the largest country in East Africa covering a area of 945,087 km2. The livestock population is estimated as 15.6 million cattle, 9 million goats and 3.6 million sheep. The majority of this stock is kept under a pastoral husbandry system characterized by extensive uncontrolled movement within Tanzania and between its neighbouring countries. So, the country is highly vulnerable to transboundary diseases like the mosquito borne disease (e.g. Nairobi Sheep Disease, Rift Valley fever).

The diagnosis of animal diseases is conducted in the Central Veterinary Laboratory in Dar-es-Salaam and in the Veterinaty Investigation Centres in the regions. Tanzania had experienced periodic outbreaks of RVF characterised by an abortion storm in domestic ruminants in 1977-78, in 1987-88 and in 1997-98. Vaccination against RVF have not been petformed in Tanzania during the last outbreak.

2.2. Diagnostic activities in Kenya and Tanzania.

The diagnosis of animal diseases is carried out in the Central and the Regional laboratories.

In the central Laboratories, the activities are performed through the following services: pathology, virology, bacteriology, helminthology; acariology and chemistry.

The regional laboratories handle all diagnosis of bacterial and helminthic diseases but viral diseases are only diagnosed in the Central laboratories in Kabete (Kenya) and in Dar-es-Salaam (Tanzania).

In 1998, the following activities were reported about the viral diseases:

2.2.1. In Kenya:

(a) Diagnosis of Rabies:

The capacity of the laboratory for rabies diagnosis is by performing Fluorescent Antibody Test (FAT) and mice inóculation. In 1998, a total of 88 cases were submitted for diagnosis as compared to 110 cases in 1997.

(b) Diagnosis of Rinderpest:

In 1998, a total of 9378 bovine sera tested using the Competitive Elisa (cElisa) for post vaccination antibody to rinderpest in 1998 and 5442 sera were found positive, equivalent at 58.0 %.

(c) Diagnosis of Rift Valley fever:

In 1998, a total of 842 sera from domestic ruminants collected from 19 districts within Kenya were tested by Indirect Fluorescent antibody test (FAT) and 396 sera were found positive. The seroposivity in RVF specific antibodies were different between the animal species: for camels: 100% (N=5 X=5), for cattle: 54.12% (N= 667, X=361), for sheep:18.86% (N=106 X=20) and goats: 15.64% (N=64 X=10).

2.2.2. In Tanzania:

(a) Diagnosis of Rabies:

In 1998, 7 samples from cattle, dog, cat and leopard were tested and 4 were found positive.

In 1999, 5 samples were submitted for diagnosis with 1 considered positive.

(b) Diagnosis of Rinderpest:

In 1998, a total of 14069 bovine sera, 3206 sera from small ruminants and 20 sera from wildlife were tested for rinderpest antibody using the competitive elisa.

(c) Diagnosis of RVF:

During the months of January and February 1998, symptoms of RVF were observed in cattle, sheep, goats and camels in 7 different districts (Arumera, Ngorongoro, Monduli, Kiteto, Simanjiro, Mwanga and Tanga) of the Northern zone.

In the Arumera District, camels were particulary affected, with 31 aborting out of 40 pregnant ones and 16 deaths out of a total of 216 camels.

194 sera collected from camel, goats, sheep in the 7 above affected districts and sent to South Africa for testing were positive for Rift Valley fever (using tests like HAI, PCR, Elisa IgG and IgM) (Table 1). In humans, RVF was also confirmed positive in three districts (Monduli, Ngorongoro and Hai).

11 out the 194 sera were positive in IgM antibodies, indicating recent RVf infection in humans (2 IgM+), goats (5 IgM+) and sheep (4 IgM+). No IgM were found in the camel sera.

In 1997-1998, 1230 sera coliected in several districts from cattle, goat and sheep have not yet been totally tested during our visit.

Table 1: Results of Analysis of sera collected amongst humans and domestic animals in the Northern zone of Tanzania during the El nino rains in 1997-I 998.

Species	Number of sera Tested	Number of positive sera	% of positive sera
Human	13	3	23.07
Camel	48	36	75
Goat	69	27	39.13
Sheep	64	28	43.75
Total	**194**	**94**	48.45

2.3. The capacity of the veterinary laboratories to diagnose Rift Valley fever:

2.3.1. The RVF can be diagnosed by virus isolation and virus identification from liver, spleen, blood, lymph nodes in Vero cells, BHK cells, embryonated chickens' eggs, by animal inoculations in hamster and in mice and by serological techniques (Serum neutralisation, Complement fixation test, Fluorescent antibody test, Hema-agglutination inhibition test and Elisa test).

2.3.2. The two central Veterinary Laboratories in Kabete and in Dar-es-Salaam have the adequate equipment for virus isolation and identification (see appendix) such as Class II Hood, CO2 incubator, Microscopes, histopathology and animal inoculation facilities. The staffs have the basic competency in performing the virological techniques which are necessary to diagnose the RFV in the laboratory and to confirm a field diagnosis. In Kabete Laboratory, staff vaccinated against RVF (Drs Mbugua and Macharia and their teams) can safely carry out the tests in P2 facilities and can make an accurate primary diagnosis of the disease. In Dar-es-Salaam, the staff (Dr Buza and his team) involved in RVF laboratory work must be vaccinated against RVF. They must receive 2-3 inoculations with the killed human vaccine.

During our visit, we noticed that the two laboratories have temporarily lost the capacity to carry out tissue culture based work due to the lack of some reagents (media for tissue culture, enzymes buffers, antibiotics) and usual consumables (flasks, filters, glassware,)

2.3.3. For the serological techniques, we recommend to test the sera by fluorescent antibody test (FA test), the virus neutralisation test (VN test) and Elisa test.

A serological response to RVF virus infection can be detected within 3 days of infection by VN test. The other tests reveal antibodies within 6-7 days of infection. The VN tests are performed with live virus and are not recommended outside an endemic area. The VN test is quite specific and can be used to confirm any sero-diagnosis that is doubtful.

The Elisa test is specific and permits separation of IgG and IgM. IgM are a valuable indicator of recent viral infections. In cattle, the duration of IGM is estimated at 2-3 months after a natural infection. The Elisa is recommended as a reliable and sensitive method to detect either infection or vaccine antibodies.

In Kenya and in Tanzania, the central laboratories have the basic competency in performing the serological tests liké Elisa. They also possess also the adequate equipment for carrying out Elisa tests (reader, computer and software, printer, distilled water used for Rinderpest serology). During our visit, they have not developped the capacity for laboratory confirmation of IgG and IgM seropositivity of RVF virus using IgM Elisa test by the lack of reagents (RVF specific antigens, antibodies, conjugate, etc,).

The acquisition of a Elisa Kit will make possible to determine the IgM antibodies, indicative of recent RVF virus infection in the selected sentinel herds and to determine the overall seroprevalence of RVF in the countries.

2.3.4.The capacity of these two laboratories for viral diseases diagnosis must be improved and for Dr Macharia, head of virology section in Kabete since 1992, the main problems are the followings:

(a) the virus isolation in tissue culture is dependent on cells, eggs supplies from the Vaccine Production unit (or KEVEVAPI),

(b) the power failures were the cause of losses of reference viruses, diagnostic reagents, serum bank, tissue culture and equipment breakdown,

(c) during our visit, the virology section was in renovation(painting) and all the equipment and activities were moved to the pathology building. For the next move to the virology section, we proposed a lay out (see annexe)after discussion with Dr Macharia, head of the section in order for him to carry out safely RVF diagnostic in the laboratory.

And we propose the following improvements:

(d) for the virus isolation in tissue culture, the virology section should be sufficient through provision of a small tissue culture unit and a vehicle for collection of primary cell cultures,

(e) The purchase of RVF IgG and IgM Elisa Kit is the unique obstacle to carry out the Elisa test in Kabete and Dar-es-Salaam veterinary laboratories,

(f) For the constant electrical power failures, the installation of generator or the connection with the Vaccine Production Unit's generator will be very helpful.

In spite of these problems, the diagnostic and investigations activities in the virology section continued in parternship with the Kenya Agriculture Research Institute or KARI (Drs Soi and Ngichabe) for confirmation for RVF (virus isolation and Elisa test), Lumpy Skin Disease (PCR test , Dr Binepal). In KEMRI (Kenya Medical Research Institute), they are facilities for diagnosis of human specimens by Elisa IgG and IgM.

In Tanzania, there is no facilities for RVF diagnosis or animal viral diseases outside the Central Veterinary Laboratory in Dar-es-Salaam.

2.4.Selection and sampling sentinel herds:

2.4.1. RVF surveillance can be accomplished by a variety of approaches including case finding, serological survey, attempts at virus isolation in animal or entomological specimens, and geographical and meteorological information systems.

Data obtained from satellite imagery will help to predict and prevent future RVF epizootics or epidemics; however, such data is expensive and will therefore be used in association with classical serosurveys based on domestic ruminants which are sensitive, inexpensive detection tools. We chose a serological surveillance system according to local conditions, specially herdowners agreement, cost and

effectiveness. herds are selected so as to be representative of the areas under study and enough sensitive to detection of RVF virus re-emergence.

2.4.2. The serosurvey of domestic ruminants appeared for us to be the most convenient way to detect any RVF virus activity even at a low level. Cattle herds were selected from the Central, Eastern, Rift valley provinces of Kenya and from the Arusha region (Monduli, Ngorongoro, Simanjiro districts) and the Kilimanjaro region (Hai District) **of** Tanzania. **The** cattle was preferred to the other domestic ruminants (sheep and goats) because the farmers are more prompt to report abortions and still births in cattle.

The owners were asked to participate in the surveillance of the Rift valley fever. In return for their help or their motivation , they receive a free veterinary service and a limited amount of veterinary drugs, like anti-helmintics and antibiotics.

For each herd, 30 animals were selected for bleeding and periodic rebleeding. The owners were asked to provide young animals (of one year old) which had no experience of the last 1997-1998 Rift valley fever outbreak. So, these animals must be born after September 1998 and not infected by the RVFV (be without specific antibodies and sero-negative). Cattle are ear-tagged for identification and their ages are estimated by teeth examination.

The animals are bleeded from external jugular vein and visited four times (with re-bleeding) throughout the year, during the two raining seasons, March to May and October to December in order to investigate the evolution of RVF viral IgM and neutralizing antibodies and clinical signs like abortions and still births. Vaccination history, environmental and geographical informations (rainfall, presence of mosquitoes,) were taken.

Migration movements and purchase of animals histories must be obtained on all herds and these information must be confirmed by local veterinary offices.

During the visit, the selected herds were the followings:

(a) In Kenya:

Eastern province, near Tanzania border

Herd 1: Machakos Veterinary farm:
altitude: 2124 m, latitude: 1” 40 00 South, longitude: 37” 20 00 East

Rift Valley Province

Herd 2: Naivasha NAHR veterinary farm:
Altitude: 1899 m, latitude: 0” 60 00 South, longitude: 36” 50 00 East

North Rift Valley Province, near Uganda border

Herd 3: Macheo farm Ltd:
Altitude:1893 m, latitude: 1” 00 00 North, longitude: 35” 00 00 East

Central Province, near Nairobi district

Herd 4: Sukari ranch :
Altitude: 2146 m, latitude: 1” 00 00 South, longitude: 37” 00 00 East

In Kenya, we selected exotic breeds of exotic livestock (Friesian, Aryshire croos) which are considered to be more susceptible than indigenous breeds (Zebu).

The North-eastern province was not visited because some of the districts were insecure and required armed escort to visit their rural areas.

(b) In Tanzania:

Arusha Region, near Kenya border

Herd 1: Longido village:
Altitude: 2629 m, latitude: 2” 00 00 South, longitude: 36” 00 00 East
Herd 2: Olbabal village
Altitude:1484 m, latitude: 03” 00 08 south, longitude: 35°30 04 East
Herd 3: Terat village
Altitude:1472 m, latitude: 03” 54 61 South, longitude: 36°34 64 East

Kilimanjaro Region, near kenya border
Herd 4: KNCU Molomo farm:
Altitude: 1276 **m,** latitude:03° 09 25 South, longitude:37°02 21 East
In Tanzania, except the Molomo farm with exotic breed (Aryshire), the animals tagged were indigenous (Tanzania short horn zebu)

Table2: Sentinel herds established through bleeding and tagging animals in areas at risk of Rift Valley fever in Kenya.

Provinces	Districts	Villages	Date of visit	Nb of animals
Eastern	Machakos	Machakos Veterinarv farm	1/12/1999	30
Rift valley	Naivasha	Naivasha NAH Veterinary farm	2/12/199	30
North Rift Valley	Eldoret	Nabwera's farm	3/12/1999	Not done
Central	Thika	Sukari Ranch	4/12/199	30
Total	**4 districts**	**4 villages**	4 **days**	**90 animals**

Table 3: Sentinel herds established through bleeding and tagging animals in areas at risk in Tanzania.

Regions	Districts	Villages	Date of Visit	Nb of animals
Arusha	Monduli	Longido	12/12/1999	33
	Ngorongoro	Olbalbal	13/12/1999	30
	Simanjiro	Terat	14/12/1999	30
Kilimanjaro	Hai	KNCU Molomo farm	14/12/199	30
Total	**4 Districts**	**4 villages**	4 **days**	**123**

In conclusion, to determine wether RVF virus continues to circulate among domestic ruminants in Kenya and Tanzania, individual calves from herds throughout the affected areas were sampled sequentially and RVF viral antibodies measured. The analysis of the 123 sera collected in Tanzania by RVF IgM Elisa and VN tests in Laboratoire national de l'Elevage et -de Recherches Vétérinaires de Dakar, Sénégal revealed no IgM antibodies, indicative of recent viral infection but some of sera were positive in VN antibodies.

III. CONCLUSIONS:

3.1. Sentinel herds have been established in areas at risk in Kenya and Tanzania for an early warning system for RVF and other TADs. They have already produced results showing that there is no recent RVF virus circulation (123 bovine sera negative for IgM antibodies) in the regions of Arusha and Kilimanjaro of Tanzania.

3.2. In Kenya, exotic breeds are chosen because they are considered to be more susceptible to RVFV infection, so outbreaks are likely to be more severe when they are involved in the epizootics. Moreover, the owners are more prompt to report abortion and still births in cattle.

3.3. Some Villages or sites were chosen (e g longido village) to be close to country's borders because of the uncontrolled animal movements, the countries are vulnerable to trans-boundary diseases. A consideration is given to survey the wildlife (olbalbal village located in the Ngorongoro Conservation Area).

3.4. The Central Veterinary Investigation Laboratory in Kabete and The Virology Department of Animai Diseases Research Institute in Dar-es-Salaam have the laboratory equipment of performing the RVF techniques which are required for isolation and serology.

3.5. A specific RVF diagnosis was chosen with Elisa assay. This diagnostic permits separation of IgG and IgM; and IgM are a valuable indicator of recent infections with or without abortion in the herds. The acquisition of Elisa is the only obstacle to carry out this test in the East-african visited veterinary laboratories. They are used to perform this test for rinderpest surveillance since many years.

3.6. The Vaccine production Unit (KEVEVAPI) at Kabete is capable of preparing a modified live RVF virus vaccine in adequate quantities to meet the requirements of Kenya and Tanzania. This could be done in relatively short time. The vaccine (Smithburn strain) is totally safe in cattle and non pregnant sheep and goats.

IV. RECOMMENDATIONS:

We recommend:

4.1. That emergency TCP funding be maintained to meet the urgent needs for the current situation, which follows the 1997-1998 RVF epidemic on livestock in East Africa.

4.2. That FAO should consider maintaining the funding of this TCP project to sustain the early warning system established with the sentinel herds, and to continue the epidemiological investigations to understand the real effects of the El Nino rains of 1997-I 998 in Kenya and Tanzania.

4.3. That FAO should consider the acquisition of RVF IgG ang IgM Eiisa Kit as the main obstacle for establishing the RVF Elisa diagnosis in Ëast Africa. A Elisa RVF IgG and IGM Kit from South Africa is available and the test was recently conducted successfully in some west african veterinary laboratories (in Bamako and in Dakar). This test permits to detect IgM antibodies, valuable indicator of recent viral infections in the sentinel herds. One kit can test 1000 Sheep, Goat and Bovine sera for IgG or IgM antibody detection.

4.4. That testing of serum samples collected for Rinderpest or RVFsurveillance that could provide an indication of geographical distribution of RVF in the country and could be used to assist in identifying areas at of future outbreaks.

4.5. That funding be given (if requested) for a vaccination campain against (early interventions can be undertaken and major outbreaks avoided)

4.6. That consideration should be given to establish the Central Veterinary Investigation taboratoty of Kabete as Regional FAO Collaborating Center for Rift Valley in East Africa. There is no active veterinary laboratory in East Africa to investigate problems caused by RVF. It can provide laboratory and manpower expertise for the region.

4.7. That national governments should provide enough financial support with operational funds for field studies and also to cover expenses for electricity, water and telecommunication facilities, and to maintain rehabilitation of laboratory facilities e g the virology section in kabete Veterinary Laboratory.

4.8. That co-ordinating group (with veterinarians, physicians, entomologist, farmers, etc,) for RVF be established to facilitate the rapid planning, co-ordination and implementation of surveillance and control activities.

V. ANNEXES:

Annexe I.

Terms of Reference

Under the overall supervision of the Chief, TCOR and the technical guidance of the Chief, AGAH, Headquarters and in close collaboration with the Project Co-ordinator, the incumbent will:

(1) Investigate the possibilities for the establishment of a sero-monitoring program in sentinel herds/flocks in RVF prone areas of Tanzania and Kenya and draw up concrete plans for the initiation and management of such a program;

(2) Draw up work plans according to which such program will function, including costs: over a period of five years;

(3) Indicate the needs , both at laboratory and field level for the successful execution of these programs;

(4) In collaboration with the project co-ordinator, in vestigate the possibility of establishing a sero-monitoring program in Uganda, and make appropriate recommendations;

(5) Provided a detailed report on the findings of the mission and on further recommendations to secure seromonitoring programmes in the region to the project Co-ordinator and the Chief:AGAH for Distribution to the Veterinary Services concerned.

Annexe II.

Activities during the mission in Kenya and in Tanzania

25111 II 999

Departure from Dakar to Nairobi (via Addis Ababa), Flight ET 942,

2611 III 999

Arrivai at Nairobi, Flight ET 851,

Visit to the Project Co-ordinator Office in Centrai Veterinary Laboratory of Kabete,

Discussion with Dr Maurice Kalunda, Regional Project Co-ordinator (TCP/RAF/8821), on the RVF epidemiology in the region and identification of possible areas for establishing sentinel herds in Kenya,

27/11/1999

Discussion with Dr M Kalunda for a program for the fields visits for establishing sentinel Herds in four Districts (Thika, Machakos, Naivasha and Kitale) in Kenya,

Departure of Dr M Kalunda to Rome (FAO Headquarters),

29/11 /1 999

Visit to the FAO Representation Office in Kenya

Discussion with Mr Mungay, Administrative Officer of FAOR in Kenya

Visit to Central Veterinary Laboratory of Kabete and presentation of the terms of mission to Drs H.C.W. Mbugua, Senior Veterinary Officer and J.M. Macharia, Head of Virology Section, and adoption of a definitive program and the costs of fields visits in Kenya for establishing sentinel herds in Kenya,

30/11/1999

Visit to the FAO Representation Office in Kenya with presentation and agreement of the field visits program by the FAO-R of Kenya (Mr Mungay),

Visit to Coopers Pharmacy in Kabete for purchasing in ear tags, Vacutainer tubes, needles and disinfectants,

Visit to the Thika District Veterinary Office, Discussion with Dr Mbutiti, Deputy DVO and Planning of bleeding and tagging animals in the 4th sentinel herd in Kenya on Saturday 4, December by Dr Mbugua and his team of Central Veterinary Laboratory of Kabete,

1/12/1999

Visit to the Machakos Veterinary Farm for bleeding and tagging animals in the first FVR sentinel herd in Kenya and discussion with Mr Pius M. Ndosi, Farm manager,

Visit to The Machakos District Veterinary Office and meeting with Dr N.J Mwang, D.V.O, T.M.Mwololo, Veterinary Officer Clinics and Hygien, Mrs F Wambua, Animal Health Assistant and Mr D.Mutiso, Animal Health Assistant,

2/12/1999

Visit to the National Animal Husbandry Research Centre (N.A.H.R.C) of Navasha for for bleeding and tagging animals in the second FVR sentinel herd in Kenya and discussion with Dr S.N.O. Sinkeet, Centre Director, Mr Sitinei, Livestock Officer and Mrs J. Kira, Animal Nutritionist,

Visit to the Naivasha Veterinary Office and review of animal diseases in the district of Naivasha (Dr V. Wanjohi, Naivasha D.V.O. and Mr P. Mbau, Filing Officer),

Visit to Veterinary Investigation Laboratory (V.I.L)of Nakuru and Review of technics ,analysis results, animal diseases in the Rift valley Province with Dr R.M Muriithi, Head of the VIL,

Visit to the Koibatek District Veterinary Office, District Head quarter in Eldama Ravine, and discussion with the Dr Cheruiyot, D.V.O,

311211999

Visit to the Kitale Veterinary Office and discussion with Dr P.N. Ndungire, Veterinary Officer Clinics, Dr Jacob Okumu Wangala, Animal Health Officer and Dr C.N Nyongesa, Veterinary Officer In charge the Macheo Farm LTD and planning of bleeding and tagging animals in the 3d sentinel herd in Kenya on Monday 6, December by Dr Nyongesa,

4/12/1999

Departure from Nairobi to Dar-es-Salaam, Flight KQ 840,

6/12/1999

Visit to the FAO Representation Office in Tanzania,

Discussion with Mr J.Yonazi, National Program Office; and J.P. Snell, Administrative Officer of FAOR in Kenya,

Visit to National Veterinary Service of Tanzania and presentation of the terms of mission to Drs Pomela, Epidemiologist, Dr K.M.Majaliwa, Tanzania PARC Project Co-ordinator, Dr J.Buza, Head of Virology Department and C.M. Ngeleja,

Visit to the Directory of National Veterinary Service of Tanzania and meeting with Dr K.M. Majaliwa, Officer-In-Charge Vet Services

7112199

Visit to the Virology Department with Drs J Buza and C.M. Ngeleja,

Presentation of the Terms of Reference, Review of the activities on RVF in Tanzania and adoption of a definitive program and the costs of fields visits in Kenya for establishing sentinel herds in Tanzania,

Visit to the Tanganika Farm Association (TFA) in Dar-es-Salaam,

8/12/1999

Visit to the Animai Diseases Reseach Institute and meeting with Drs P. Mkonyi, Director, L.Kagaruki, entomologist,

Visit to the FAO Representation in Tanzania and Contact by phone to F.A.O Headquarters for authorisation of Funding the Field visits Program in Arusha Region for establishing sentinel herds in Ngorongoro, Simanjiro, Monduli and Mwanga Districts.

911211999

Tanzania Independence Day

Review of the virology Department activities with Dr J Buza

1011211999

Visit to FAO Representation in Tanzania and Contact by phone to F.A.O Headquarters (Mrs Niggeman) for authorisation of Funding the Field visits Program in Arusha Region for establishing sentinel herds in Ngorongoro, Simanjiro, Monduli and Mwanga Districts.

Visit to Chemolab Diagnostics Limited for buying Tubes and needles

Departure From Dar-es-Salaam to Harusha With Dr J Buza, Head of Virolgy Department,

Visit to Dr Kimaro, National consultant in TCP RVF. DVO Of Moshi, Tel 0811 **65 1465,**

11/12/1999

Visit to Dr Kimaro, National Consultant of The TCP Rift Valley Fever in Tanzania, DVO of Moshi,

Visit to Dr Morrel J.O, Officer in charge veterinary Investigation Centre, Northern Zone, Arusha

Visit to Tanganika Farmers Association LTD in Arusha,

Visit to the DVO of Munduli District

12/12/1999

Visit to Longido Village, near kenyan border, for bleeding and taging the first sentinel herd in Tanzania with Reginalid Swai, Animal health Officer,

13/12/1999

Visit to Olbalbal village, in Ngorongoron district, For bleeding and taging the second sentinel herd with Dr Patrice Mattay, Veterinary field Officer;

14/12/1999

Visit to Terat Village, Simanjiro District, for bleeding and taging the third sentinel herd

Visit to Farm LTD Hai district, for bleeding and taging the fourth sentinel herd.

1 5/1 211999

Review field sampling procedures with Dr Morrel, Officer-In-Charge VIC Arusha and all the participants to the field visits Dr Buza, Head of virology Department and Mr Bwanga, Technician in Arusha VIC

Departure from Arusha to Dar-es-Salaam

16/12/1999

Collecting of field serum samples in the Virology Laboratory in Dar-es-Salaam

Visit to FAO Representation In Tanzania for final activities review with Mr Monazi,

1711211999

Departure from Dar-es-Salaam to Dakar (via Nairobi and Addis Ababa)

181121199

Arrival in Dakar (Flight ET 963)

Annexe III.

List of personnel in Virology sections in Central Veterinary Laboratory Kabete and Animal Diseases Institute in Dar-es-Salaam

A) Viroiogy Department, Animal Diseases Research Institute, Dar-es-Salaam;

(1) Dr J. Buza, Veterinary Doctor, PhD Immunology, Head of the Virology Department
(2) Dr P. Wambura, Veterinary Doctor, Doing PhD Immunology in Australia
(3) Dr C. Ngelaja, Veterinary Doctor, Msc Veterinary Public Health
(4) Mr G. Joshua, Senior Laboratory Technician,
(5) Mr S. Bureta, Laboratory Technician,
(6) Mr P. Mosha, Laboratory Technician,
(7) Mr Z. Issa, l-aboratory Technician,
(8) Mr A. Meela, Laboratory Technical Assitant
(9) Mr V. Mtalemwa, Genenra Worker
(10) Mr K. Msangi, General Worker

B) Virolgy Section, Central Veterinary Laboratory of Kabete, Kabete

(1) Dr Joseph M. Macharia, Senior Veterinary Officer, Head of the Section,
(2) Dr Jane M. Mbura, Veterinary Officer I, Rabies Diagnosis and Elisa Serology,
(3) Dr Jacqueline L. Kasiiti, Veterinary Officer II, Egg work, Elisa Serology and Diagnosis of NCD, RVF and Gumboro Disease,
(4) Mr Jack L. Omolo, Animal Health Assistant, Senior Laboratory technician, Tissue culture and virus isolation,
(5) Mr Stephen G. Gachem, Animal Health Assistant, Laboratory technician, Elisa serolgy Rinder Pest,
(6) Mrs Virginiah W Karinki, Animal Health Assistant, Laboratory technician, Egg Work, virus isolation and harvesting, Elisa Serolgy,
(7) Mr Eliud Muhia J, Laboratory Technician, Washing and Cleaning Glassware,
(8) Mr Simon S. Sande, Laboratory technician, Tissue Culture,
(9) Mr Joseph K. Kamau, Laboratory Technician, learning on the job,
(10) Mr Wachire, Laboratory Technician, learning on the job,
(11) Mr Elfasi A.Karani, Animal Health Assistant, Laboratory Technician, learning on the job,

C) Budget for one field visit for Rift valley fever surveillance by sentinel herds in Kenya

(1) Activities Program

Day one:
Visit to the District Veterinary Office of Thika (Central Province)
Visit to the Sukari Ranch for bleeding ear-tagged animals

Day Two
Visit to Machakos Veterinary Office (Eastern Province)
Visit to Machakos Veterinary Farm for bleeding ear tagged animals

Day Three
Visit to Naivasha Veterinary Office
Visit to NAHRS Veterinary farm for bleeding ear-tagged animals
Visit to Nakuru Veterinary Investigation laboratory

Day Four
Visit to the District Veterinary Office of Kitale
Visit to the Macheo Ltd Farm for bleeding ear-tagged animals

Day Five
Review of Rift valley fever field samples with the DVOs of Kitale and Nakuru
Return to Kabete Central Veterinary Laboratory, Nairobi

(2) Date of Visits of sentinel herds throughout a Year in Kenya during the two raining seasons (long rains and short rains):

First Visit on the first week of October
Second Visit on the third week of December
Third Visit on the first week of March
Fourth Visit on the third week of May

(3) Participants :

1 Scientist
1 Technician
1 Driver
1 Field Veterinary Office

(4) Travelling Expenses:

Vehicle Type 4X4 (Land Rover, Pajero)
Estimated distance to be covered
3,800 km

Fuel at a rate of 4 km/litre	950 litres
Cost of fuel at 49 Ksh/litre	Ksh. 46,550
Estimated vehicle maintenance contigency	Ksh. 5,000
Sud total	**Ksh. 51,550**

(5) Subsistence allowances

3 persons at a rate of Ksh. 2,500 each for Five days	Ksh 37,500
1 person at a rate of Ksh. 3,500 each for Five days	Ksh 17,500
Subtotai	**Ksh 55,000**

(6) Equipment and Consumables	Cost Ksh.
1 apparatus GPS	1,000
200 plain Venojet Tube	**3,000**
1 Box of 100 Venoject needles	**800**
3 needle holders	**60**
1 box of disposable obstretrical glove	1,000
1 box surgical glove	**800**
1 roll cotton wool	**500**
200 Adhesive Label	**1,000**

200 cryo-vials	**3,000**
100 polypots	**1,000**
10 litres of antiseptics	**2,000**
10 litres Plastic cool box	**4,000**
1 ear tag applicator	**3,500**
200 ear tad	**20,000**
200 doses of Antibiotics	**500**
200 doses of Anthelimintics	**500**
Sub total	**42,660**
Total estimate of monetary expenses (Equivalent at 2,487 US dollars)	**149210 Ksh.**

D) Budget for RVF surveillance in Kenya

(1) Field visit

- 4 field visits to the sentinel herds (5 days per visit) per year: 10,000 US Dollars (at a rate 2,500 US Dollars per visit)
- 2 fieid visit per year to suspect FVR outbreaks: 5,000 US Dollars

Subtotal: 15,000 US Dollars

(2) Purchase of FVR Elisa IgG and IgM Kit

- 1 Kit IgG per Year 2,500 US Dollars
- 1 Kit IgM per Year 2,500 US Dollars

Subtotal: 5,000 US Dollars

(3) Purchase of RVF reagents for virus isolation and identification:

- Reference antibody and antigen for Fluorescent and Neutralization tests 1,000 US Dollars
- Media for tissue culture 2,000 US Dollars
- Chemicals 1,000 US Dollars
- Glassware 2,0000 US Dollars

Subtotal: 6,000 US Dollars

(4) Equipment

1 Freezer 1,500 US Dollars
1 GPS apparatus 2,000 US Dollars

Subtotal 3,500 US Dollars

(5) Vehicle repair 3,000 US Dollars

Total budget per year : 32500 US dollars

Total budget for 5 years: 162,500 US Dollars

Annexe IV.

List of materiel in Virology sections in Central Veterinary Investigation Laboratory of Animal Diseases Institute in Dar-es-Salaam

A) Virology Department, Animal Diseases Research Institute, Dar-es-Salaam:

(1) Single Channel Micropipettors, 10-100ul, 50-200 ul and 100-1000 ul
(2) Multi Channel Micropipettors, 5-50 ul (12 channels), 50-250 ul (12 channels), and 5-50 ul (8 channels),
(3) Shaker incubator
(4) Orbital shaker,
(5) Analytical Balance,
(6) PH meter
(7) Elisa Reader, Titer-teck Multiscan PLUS type 314,
(8) Computer with Elisa Software, IBM PC 300 PL,
(9) Magnetic Stirrer,
(10) Bench Centrifuge, Jouan C312,
(11) Bench Centrifuge, Heraeus Christ Laborage A,
(12) Pump, Millipoer XX 5522050,
(13) Pump, Arthur Pfeiffer Hochvakuum Technik,
(14) Water bath, Memmert,
(15) Water Distiller, Fistreem Cyclon,
(16) De-ioniser, Elgastat Option 4 Water Purifier with reservoir,
(17) Generator,
(18) Balanec, Harvard Trip 2 Kg Ohaus,
(19) Walking Incubator,
(20) Sonicator, Soniprobe Type 7530A
(21) Laminar flow Safety cabinet, Class II, InterMed MDHX2,
(22) Sterilizer fish Kettle, Caenaho B CCCP 1968 H,
(23) Autoclave, Express Equipment,
(24) Autoclaves, Webeco All X2,
(25) Hot-air Oven, Gallenhamp,
(26) Deepfreezer (-20C),
(27) Freezer (20C),
(28) Cold rooms,
(29) Tissue culture incubator,
(30) Microscopes,
(31) Motor roller machine for tissue culture,
(32) Equipment not available:
- Elisa Washer,
- Micro-Heamatocrit centrifuge,
- Haematocrit reader,
- Freeze-drier,
- Homogeneiser/Stomacher,
- Incinerator

B) Virology Section, Central Veterinary Laboratory, Nairob

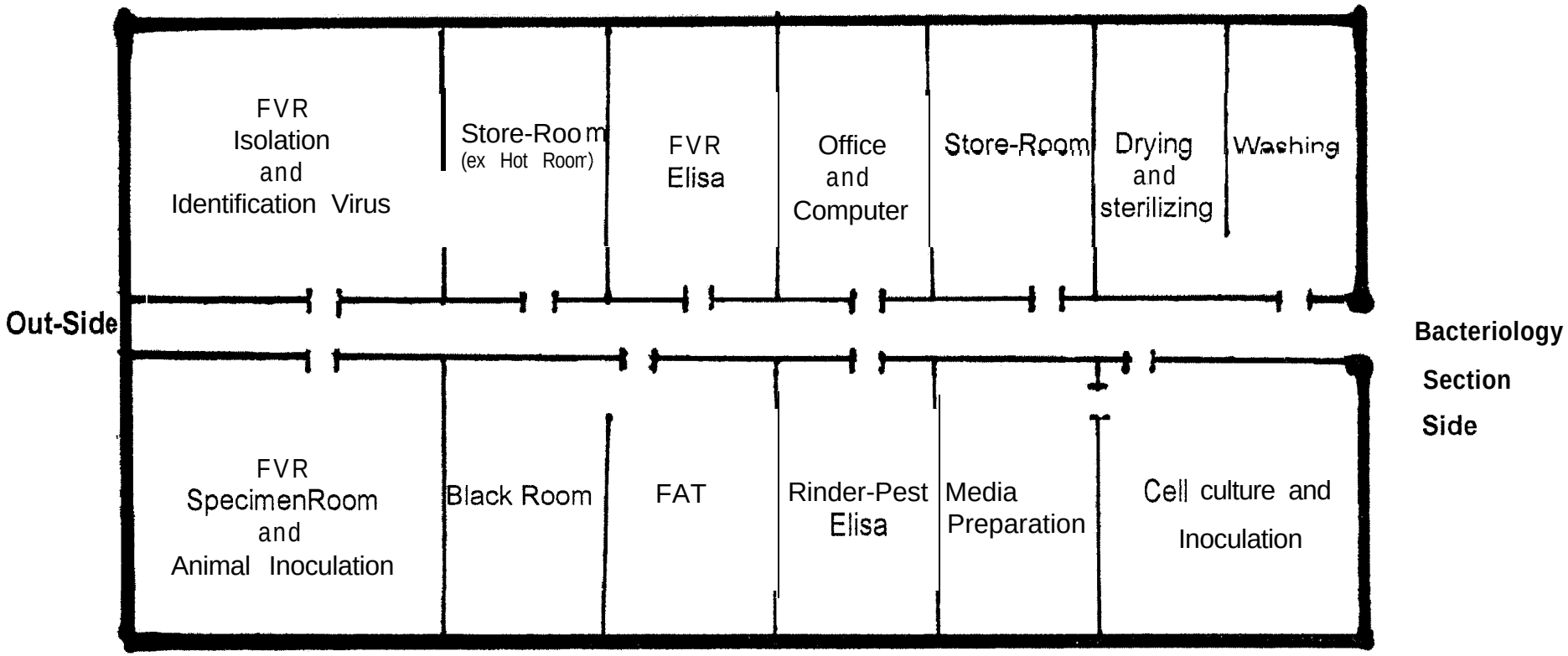

Figure N°1:

Proposed lay out of Central Veterinary

Investigation laboratory, Kabete, Nairobi, Kenya

Annexe V.

Proposed layout in Virology sections in Central Veterinary Laboratory Kabete in Nairobi

Annexe Vi.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institut?
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 015 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

I. Date: .....

II. Owner information:

A) Name: .....
B) Residence: Village or Farm: ..... District: .....
Province or Region: .....

III. Herd information:

A) Total Number: .....
B) Species: Goat: ..... Sheep: : ..... Cattle: ..... Other: .....
C) Production: .....

IV. Environment information:

A) Climate or Vegetation: ..... Rainfall: .....
Latitude: ..... Longitude: .....
Altitude: ..... Temperature: .....
B) Presence of Mosquito: .....
C) Others faetors: .....

VI. Clinical Information on Herd:

A) Number of animais affected: .....
B) Signs and Symptoms observed:
Fever: .....
Vomiting: .....
Diarrhoea: .....
Bleeding: .....
Nasal Discharge: .....
Cough: .....
Jaundice: .....
Anemia: .....
Abortion: .....
Lameness: .....
Other Symptoms: .....
C) Received Treatment or Vaccination: .....
D) Other informations : .....

VI. Laboratory Specimen Information:

A) Type of Specimen:
Blood (for serology): .....
Blood (for virus isolation) .....
Organs: .....
Others: .....

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	Serology (VN, Elisa IgG- Elisa IgM, IHA)	Observations
1						
2						
3						
4						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
17						
18						
19						
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21						
22						
25						
26						
27						
28						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

C) Notes:

.....
.....
.....
.....

This Form Was completed by : Name et Function:

.....
.....
.....

Annexe VII.

Technics for Laboratory diagnosis of Rift Valley fever

The RVF diagnosis can be done in the field and by using laboratory methods.

I. Field Diagnosis of RVF.

The features indicative of an outbreak of RVF are:

High mortality rate in lambs, calves and kids but a lower one in adults of those species

High abortion rate among cows and ewes

Liver lesions at necropsy

An influenza like viral illness in man, specially in persons handling infective material,

Suitable conditions for mosquitoes.

Laboratoty methods must be used to confirm the field diagnosis.

II. Laboratory Diagnosis of RVF:

The specimens to be sent to the laboratory are:

The whole blood or paired serums

Tissue like liver, spleen and brain.

The specimens must be shipped frozen and packaged with wet ice at + 4°C.

2. 1. The Virus Isolation:
The samples are made into 10% suspension in nutrient broth containing antibiotics(200 units of penicillin, 200 ug of streptomycin and 5 ug fungizone per ml) and clarified by low speed centrifugation.
A sample of material is stored below -70°C for confirmation of any virus isolation.
The fresh material is inoculated intracerebrally (0,05 ml) into alitter (up tosix)one or two days old suckling mice for each sample; or into tissue culture tube of vero cells or BHK cells (0,1 ml per tube) and rolled at 37°C.
The brain is harvested from ill mice or after 10 days and is repassed through suckling mice. If a cytopathic effect (CPE) develops, the cells and fluids are harvested and repassed (after storing a sample at - 70°C) through tissue culture tubes.If no cytopathic effect develops, the material is repassed after 5 to 7 days. Virus isolated is identified by FAT test or virus neutralisation test.

2.2. Virus neutralisation test (VN test)

The VN test for RVF is carried out with sterile techniques in 96 well microtitre plates treated to allow the growth of tissue culture.

2.2.1. Serum for test:

Inactivate the sera at 56°C for 30 mn

Predilute the sera at 1/20(mix 10 ul of serum with 190 ul of medium used as diluent)

Dilute each serum at 1/40, 1/80 and 1/160(use 3 welles fro each serum(serum test; serum control positive and serum control negative)

2.2.2. Virus :

The virus to be used is Smithburn strain which is diluted to contain 100 $TCID_{50}$ per 50 ul.

2.2.3. Diluent:

The diluent is MEMG +10% fœtal calf serum(FCS.)

2.2.4.: Cells:

The tissue culture cells are Vero cells at a concentration of 2.105 cells per ml.

2.25. Controls:

(a) Cells control: These wells receive cell suspension and diluent only

(b) Positive serum control: These wells receive positive serum serum diluted at 1/40, 1/80 and 1/1 60, plus virus and cells.

(c) Negative serum control: These wells receive negative serum diluted at 1/40,1/80,1/160, plus virus, plus cells.

(d) Virus control: These wells receive virus diluted at 10^0, $1\ 0^1$, $1\ 0^2$, $1\ 0^3$, $1\ 0^4$, four wells per dilution, the concentration used in the test being 10^0 .

2.2.6. sequence of test:

The reagent are added to microtiter plates in the following order:

(a) 50 ul of serum diluted at 1/40,1/80, 1/160.

(b) 50 ul of virus with 100 $TCID_{50}$

(c) Shake.

(d) Incubate 60 mn at 37°C.

(e) 100 ul cells at 2.10^5 cells per ml.

(f) Incubate five days at 37°C in a carbon dioxide incubator.

(g) Cytopathic effect (CPE) should be clearly observed in negative serum control and virus control.

(h) Calculate 50% endpoints using the method of Reed and Muench.

(i) A positive is considered positive when no CPE is observed at dilutions 1/40,1/80,1/160.

2.3. Elisa test

(Method using for the RVF Elisa Kit of National Institute for Virology, South Africa)

2.3.1. IgG antibody detection

2.3.1 .1. Reagents and Chemicals

Anti RVF Hyperimmune mouse ascitic fluid(HMAF),

RVF antigen

Control antigen,

Anti-sheep IgG conjugate(HPRO0)

Positive serum control

Negative serum control

PBS

Skimmed Milk Powder

Wash buffer

TMB substrate

Stop solution

2.3.1.2. Sequence of the test:

(a) Coat plate with 100 ul coating antibody(HMAF) diluted at 1/2000 and incubate ovemight at +4°C and wash three times.

(b) Block using 200 ul well 10% skimmed milk/PBS and incubate 1 h at 37°C and wash three times.

(c) Add 100 ul of RVF and negative control antigen diluted at 1/400 and incubate 1 h at 37°C and wash three times.

(d) Add 10 ul test and serum diluted at 1/100 to RVF and control antigen and incubate 1 h at 37°C and wash three times.

(e) Add 100 ul anti-sheep IgGHPRO conjugate diluted at 1/4000 and incubate 1 h at 37°C and wash three times.

(f) Add 100 ul of TMB substrate and place 10 mn in dark at 22°C.

(g) Add 100 ul of Stop solution.

(h) Read the Optical Densities at 450 nm.

A net OD value of >=0.400 is considered positive in IgG.

2.3.2.IgM antibody detection:

2.3.2.1. Reagents and Chemicals:

Anti-sheep IgM antibody

RVF antigen

Control antigen

Anti RVF hyper-immune mouse ascitic fluid (HMAF)

Anti-mouse immunoglobuli conjugate (HPRO)

Positive seruni

Negative control serum

PBS

Wash buffer

TMB substrate

Stop solution

2.3.2.2. sequence of the test:

(a) Coat plates with 100 ul capture antiboby (anti-sheep IgM) diluted 1/1000 and incubate overnight at +4°C and wash three times.

(b) Block with 200 ul with 10% skimmed milk with PBS and incubate 1 h at 37°C.

(c) Add 100 ul of test ant control sera diluted at 1/1 00 and incubate 1 h at 37°C and wash three times.

(d) Add 100 ul of RVF and control antigen diluted at 11400 and incubate 1 h at 37°C and Wash three times.

(e) Add 100 ul anti-RVF HMAF diluted at 1/4000 and incubate 1 h at 37°C and wash three times.

(f) Add 100 ul anti-mouse IgG HPRO conjugate and incubate 1 h at 37°C and wash three times.

(g) Add 100 ul TMB and place 10 mn in dark at 22°C.

(h) Add 100 ul of Stop Solution.

(i) Read at 450 Nm.

The optical density value recorded for each serum dilution with control antigen is substrated from OD value recorded with RVF antigen to obtain net ajusted OD value. Net OD values of >= 0.44 are considered positive.

Photograph N°1 :

Scene of contention of croosbreed calves in Machakos Veterinary Farm, Machakos District, Eastern Province, Kenya

Photograph N°2:

Scene of bleeding of Zebu calves in longido Masai's village, District of Mondulo, Arusha region, Tanzania

Annexe X
Rift valley fever vaccine annual consumption in Kenya

1989	**26,000 Doses**	**Districts (6)*:** Isiolo, Laikipia, Naivasha, Nakuru, Nanyuki, Kisii
1990	**48,900 Doses**	**Districts (8):** Nakuru, Naivasha, Narok, Kiambu, Laikipia, Thika, Machakos, Neiryuki
1991	**34,300 Doses**	**Districts (6):** Nairobi, Nyahururu, Nanyuki, klambu, Naivasha, Nakuru.
1992	**2,000 Doses**	**District (1):** Nakuru
1998	**170,600 Doses**	**Districts (11):** Nakuru, Kimabo, Koibatek, Kitale, Mandera, Tana River, Ngong, Maraguc, Mayale, isiolo, Nyeri
1999	**8,200 Doses**	**Districts (4):** Thika, Nakuru, Laikipia, Naivasha

* Districts (number of Districts)

FOOD AND AGRICULTURE ORGANISATION

Country: Kenya, Tanzania

Project Title: Emergency Support For Rift Valley Fever Surveillance and Control

Project Number: TCP/RAF/8821 (E)

Starting Date: January 2000

Completion Date: December 2004

Government Ministry responsible for Execution: Ministry of Agriculture

FAO Contribution: 327,000 US Dollars
(without Direct Operations Expenses)

I. JUSTIFICATION:

Rift Valley fever (RVF) is an acute, febrile, contagious arthropod-borne zoonotic disease caused by a bunyavirus of the genus of Phlebovirus. It causes high rates of abortion and neonatal mortality in sheep, goats and cattle. Other species are susceptible to a much lesser extent. Susceptibility to infection and to disease decreases with age; a high mortality rate of 95-100 % may occur in lambs and kids less than 1 week old. Man are susceptible and can be infected by direct contact with ill animals or infected materials (blood, organs, etc,)

The disease is confined to Africa in areas associated with dense populations of vector mosquito species. Periodic outbreaks have been described in East Africa since the 1930's. The cost of these was enormous in the taurine breeds, improved cattle and the sheep breeds which have been developed in this region.

The most recent RVF epizootic in Kenya (1997-1998) was associated with heavy rain related to an El Nino event. The rains were 60-100 times the seasonal average and provided ideal conditions for breeding of insect vectors of animal and human diseases. Livestock losses of up to 70% in goats and sheep and 20-30% in cattle were observed. During this epidemic, WHO reported that as many as 360 persons in Kenya and 460 in Somalia have died and noted a lack of disease surveillance and laboratory diagnosis capacity.

These recent epidemic and epizootic manifestations in East Africa prompt us to start a serosurvey of RVF in domestic animal from Kenya and Tanzania to annually assess the risk for animal and to detect any RVF virus activity even at low level.

II. OBJECTIVES OF THE PROJECT:

The main objectives of the project are:

(a) to establish technical base for RVF diagnosis and research in the veterinary laboratories in the region,

(b) to continue to monitor RVF virus activity in East Africa by the establishment of a system of identified sentinel animais in areas at risk of Kenya and Tanzania.

III. WORK PLAN OF THE PROJECT:

The current TCP/RAF/8821(E) is in place and the objectives would be apply during the extension period (2000-2004):

3.1. Year 2000:

(a) January to March:

- Introduction of the diagnosis tool of RVF by Elisa method using the Elisa FVR IgG and IgM Kit purchased from South Africa,
- Testing of the first serum samples collected from the sentinel herds during the initial visits in December 1999 in order to determine wether RVF virus continues to circulate among domestic ruminants in Kenya and Tanzania after the 1997 1998 outbreak.

(b) March to May (Long rains):

Visiting and Bleeding of sentinel herds during the first week of March,

Testing of serum samples to define the RVF virus activity at the beginning of the raining season,

Visiting and Bleeding of Sentinel herd during the third week of May,

- Testing of serum samples to define the RVF virus activity at the end of the raining season,

(c) June to September:

- Study Visit to the Senegalese RVF surveillance program during the raining season in West africa,
- Vaccination of the staff involved in the RVF surveillance in Kenya and Tanzania with 2-3 inoculations of killed human vaccine,

(d) October to December (Short rains):

Visiting and Bleeding of sentinel herds during the first week of October,

- Testing of serum samples to define the RVF virus activity at the beginning of the raining season,

Visiting and Bleeding of Sentinel herd during the third week of December,

- Testing of serum samples to define the RVF virus activity at the end of the raining season,
- Mission of RVF consultant to assist RVF Surveillance planning, to review the results and to assist with technical problems and introduce tissue culture methods in the central laboratories.

3.2. Year 2001:

Continue with the RVF surveillance through visiting and bleeding sentinel herds during the raining seasons, periods at risk,
testing sampies collected from sentinel herds or collected for Rinderpest surveillance,
Participation in a Scientific Meeting for the 2 project heads in Kenya and Tanzania with presentation of the results of RVF surveillance
Mission of the consultant,

3.3. Years 3 to Year 5

Continuation with the RVF surveillance through visiting and bleeding sentinel herds during the raining seasons, periods at risk,
Participation in a Scientific Meeting or Workshop for the 2 project heads in Kenya and Tanzania with presentation of the results of RVF surveillance
Mission of the consultant for evaluation of the RVF surveillance activities.

IV. INPUTS TO BE PROVIDED BY FAO:

4.1. Personnel:

(a) Consultants: A one month consultancy per Year to assist the RVF Surveillance Planning, to assist with technical and other problems, to review the results obtained and to help in the evaluation of the Project would be recommended.

(b) Local staff: The project which operate with local Scientific and Technical Staff would benefit from the availability of independent transport. The old vehicles (ISUZU in Kabete, PAJERO in Dar-es-Salaam) could be allocated to the project. These vehicles need reparation in order to run in the targeted areas for RVF surveillance in Kenya and Tanzania. The estimated cost for vehicle maintenance and reparation is 3,000 US Dollars per year per Vehicle (a total of 30,000 US dollars for 2 vehicles for 5 years).

4.2. Official Travel:

(a) A study Visit for the 2 project heads (Drs Mbugua and Mbuza) in the Senegalese RVF surveillance program by sentinel herds would be recommended.
(b) Attendance at a scientific meeting would be useful.

4.3. Equipment and supplies

(a) 2 Freezers: 3,000 US Dollars
(b) 2 GPS Receiver: 4,000 US Dollars
(c) 4 Elisa RVF IgG and IgM Kits per year 10,000 US Dollars
(2 Kits per year and per laboratory, a total of 50,000 US Dollars in 5 years)
(d) Laboratory consumables: 6,000 US Dollars per year and per laboratory
(a total of 60,000 US dollars for the two labs for 5years):
Media; biological reagents (reference sera and antigens, enzymes, buffers), Glassware, etc.

4.4. General and Operating Costs:

(a) 6 Field Visits per year and per laboratory: 2,500 US Dollars per visit
(a total of 150,000 US Dollars for the two labs in 5 years)
(b) Vehicie reparation and maintenance: 3,000 US Dollars per vehicle and per year.

V. REPORTING:

The Project heads, Dr Mbugua in Kenya and Dr Mbuza in Tanzania, will prepare six monthly reports on their activities and the results obtained, giving any conclusions and recommendations. They will also prepare terminal reports, in accordance with TCP procedures for finalisation and submission to the governments of Kenya and Tanzania.

VI. GOVERNEMENT CONTRIBUTION:

The governments of Kenya and Tanzania will provide the laboratory facilities and services for the execution of the project at the Central Veterinary Investigation Laboratories of Kabete and Dar-es-Salaam.
These are :
(a) Buildings and laboratories facilities at Kabete and Dar-es-Salaam,
(b) Some laboratory materials
(c) Some transport facilities,
(d) General services for water, electricity and telephone,
(e) scientific and technical staff

VII. PROJECT BUDGET COVERING THE FAO INPUTS (IN US DOLLARS)

Countries: Kenya and Tanzania

Project No: TCP RAF 8821 E

Duration: 2000-2004

Budget:

Personnel (Consultants):	20,000
Official Travel:	10,000
General Operating Expenses: (field visits, vehicle maintenance)	180,000
Supplies and Materials: (Elisa Kits, Lab consumables, equipments)	II 7,000
Direct Operating Expenses:	
Total:	327,000 US DOLLARS (except direct operating expenses):

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institute
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 0 15 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

I. Date:...12.12.1999.. .....

II. Owner information:

A) Name:Reginald Swai .....
B) Residence: Village or Farm:... Longido ....District:Monduli .....
Province or Region:Arusha... ... .

III. Herd information:

A) Total Number: .....
B) Species: Goat: 5331 Sheep:1378..... ..Cattle:7149..... ..Other:16 Camels...
C) Production: Agropastoral... .....

IV. Environment information:

A) Climate or Vegetation: Savanna, near a mountain..... Rainfall: 96 mm(from 1 to 12 Dec 99). .....
Latitude:2°43 South ..... Longitude: ..... .35°58 East .....
Attitude: .... .Temperature: .....
B) Presence of Mosquito:Low presence of mosquitos .....
C) Others factors:.. .. High presence of ticks .....

I. Clinical Information on Herd:

A) Number of animals affected: .....
B) Signs and Symptoms observed:
Fever: .....
Vomiting:. .....
Diarrhoea: Yes (in kids): .....
Bleeding: .....
Nasal Discharge: Yes.....
Cough:Yes .....
Jaundice: .....
Anemia:. .....
Abortion:Yes (in small scale).....
Lameness: .....
Other Symptoms: .....
C) Received Treatment or Vaccination:Treatment for CCPP mainly using tetracyciles, anthelmintic treatment
D) Other informations :. .....

VI. Laboratory Specimen Information:

A) Type of Specimen:

Blood (for serology): 33 sera were collected from tagged zebu, Ayshire and Fresian cattle and tested by VN and Elisa tests in Virology Service in Dakar, Senegal
Blood (for virus isolation). .....
Organs:. ....
Others:. .....

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species (or breed)	Age (Year)	Sexe	**Serology Rvf** O.D Elisa IgM, (titer VN)	Observations (name of owner)
1	401	Zebu	1	F	0.047	S Legarimo
2	402	Zebu	1	F	0.017	
3	403	Zebu	2	F	0.015	
4	404	Fresian	3	F	0.045	Marari
5	405	Ayshire	10	F	0.022	
6	406	FriesanxJers	7	F	0.017	
7	407	Zebu	1	F	0.027	
8	408	Ayshire	1	F	0.018	
9	409	Zebu	1	F	0.035	Lesitato
10	410	Zebu	1	F	0.015	
11	417	Zebu	1	F	0.039	
12	411	Zebu	1	F	0.015	Ndungani
13	412	Zebu	1	F	0.050 (80)	
14	413	Zebu	1	F	0.032	
15	414	Zebu	1	F	0.045	
16	415	Zebu	1	F	0.006	
17	416	Zebu	1	F	0.036	
18	418	Zebu	1	F	0.025 (80)	Simanga
19	419A	Zebu	1	F	0.104	
20	424	Zebu	1	F	0.047	
21	422	Zebu	1	F	0.026	
22	421	Zebu	1	F	- 0.013	
23	434	Zebu	1	F	0.025 (80)	
24	433	Zebu	1	F	0.032	
25	432	Zebu	1	F	0.017	
26	425	Zebu	1	F	0.014	
27	426	Zebu	1	F	0.018	
28	427	Zebu	1	F	0.021	
29	429	Zebu	1	F	0.018	
30	430	Zebu	1	F	0.03 (80)	
31	423	Zebu	1	F	O.195	
32	428	Zebu	1	F	0.022	
33	419B	Zebu	1	F	0.066	
34						
35						
36						
37						
38						
39						
40						

C) Notes:

Movements of animals insearch of pasture during dry season from August to September. Animals can move between 60-70 km from the village of origin
And all sera tested were negative in IgM but 4 sera were positive in VN test, indicative no recent viral infection

This Form Was completed by : Name et Function: Reginald Swai, P.O.BOX 53 Longido, Monduli, Arusha, Tanzania. .....

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institute
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 0 15 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

II. Date:... 13.12.1999.. .....

II. Owner information:

A) Name: Patris Mattay, P.O.BOX 1 Ngorongoro Crater, Arusha, Tanzania .....
B) Residence: Village or
Farm:Olbalbal... ....District:Ngorongoro .....
Province or Region:Arusha .....

III. Herd information:

A) Total Number: .....
B) Species: Goat + Sheep: 53000 ..... Cattle:29 000 ..... Other: 19 camels, 3000 donkeys, wild life
C) Production:Pastoralits and movement of the animals to highlands during the dry season for good pasture. ....

IV. Environment information:

A) Climate or Vegetation:Savanna with forest and highlands Rainfall: raining (but not records) ...
Latitude: 03°OO 08 South ....Longitude: 35°30 04 East .....
Altitude: 1484 Metres..... ....Temperature: .....
B) Presence of Mosquito:a lot of mosquitoes .....
C) Others factors:within ngorongoro conservation area and high presence of wildlife .....

II. Clinical Information on Herd:

A) Number of animals affected: 10 animals ....
B) Signs and Symptoms observed:
Fever:Yes.....
Vomiting:. ....
Diarrhoea:Yes ....
Bleeding:. ....
Nasal Discharge:Yes.....
Cough:Yes ....
Jaundice: ....
Anemia:Yes ....
Abortion:Yes ....
Lameness:. ....
Other Symptoms:Papilloma; emaciation in calves.....
C) Received Treatment or Vaccination: ....
D) Other informations :RVF Outbreak late 1597 after el nino.....

VI. Laboratory Specimen Information:

A) **Type of Specimen:**
Blood (for serology): 30 sera from young zebu female and tested by VN and Elisa IgM rests in Virology Service in Dakar, Senegal
Blood (for virus isolation)..... ..... __ ..
Organs:. ....
Others:. ....

B) List Of sera for RVF serology for sentine1 Herd:

Lab No.	Tag No.	Species (or breed)	Age (Year)	Sexe	**Serology Rfv** Do Elisa IgM (titerVN)	Observations
1	TZ 1037	Zebu	1	F	0.039 (80)	Gabriel Tonge
2	TZ 592	Zebu	1	F	0.028	
3	TZ 959	Zebu	1	F	0.051	
4	TZ 1039	Zebu	1	F	0.007	
5	TZ 1581	Zebu	1	F	0.029	
6	TZ 2282	Zebu	1	F	0.017	
7	TZ 1600	Zebu	1	F	0.02	
8	TZ 960	Zebu	1	F	0.021	
9	TZA 54	Zebu	1	F	0.036	
10	1967	Zebu	1	F	0.015	
11	TZ 3426 or 24336	Zebu	1	F	0.023	
12	1552	Zebu	1	F	0.072 (80)	
13	TZA 56	Zebu	1	F	0.045	
14	TZA 55	Zebu	1	F	0.058	
15	TZA 43	Zebu	1	F	0.032	
16	TZA 53	Zebu	1	F	0.008	
17	TZA 44	Zebu	1	F	0.034 (80)	
18	1663	Zebu	1	F	0.032	
19	TZA 46	Zebu	1	F	0.066	
20	TZA 51	Zebu	1	F	0.014	
21	TZA 52	Zebu	1	F	0.025 (80)	
22	TZA 42	Zebu	1	F	0.016	
23	TZA 41	Zebu	1	F	0.028	
24	TZA 50	Zebu	1	F	0.010	
25	TZA 45	Zebu	1	F	0.049	
26	TZA 60	Zebu	1	F	0.014	
27	TZA 59	Zebu	1	F	0.20	
28	TZA 57	Zebu	1	F	0.034	Mwasune Tonge
29	TZA 58	Zebu	1	F	0.041	
30	TZA 48	Zebu	1	F	0.039	
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

C) Notes:

Mixed grazing between wildlife and domestic ruminants

Ail sera tested were negative for IgM antibodies but 4 were positive in VN antibodies, no indicative of recent infection.

This Form Was completed by : Name et Function: Patrice Mattay, Veterinary field Staff, P.O.BOX 1, Ngorongoro Crater, Ngorongoro Conservation Area Authorization, Arusha, Tanzania... ... ...

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institute
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 015 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

III. Date:...14.12.1999.. .....

II. Owner information:

A) Name:Maulid Yusuf Msuya .....
B) Residence: Village or Farm:Terat Village.. ....District:Simanjiro .....
Province or Region:Arusha .....

III. Herd information:

A) Total Number: .....
B) Species: Goat16 000 ..Sheep: 17 000:Cattle:20 000...Other: 70 Donkeys .....
C) Production:Agro-pastoralist.....

IV. Environment information:

A) Climate or Vegetation:Dry savannna (Steppe).....Rainfall: Normal .....
Latitude: 03°54 61 South ..... Longitude:36°34 64 East .....
Altitude: 1472 Metres..... Temperature: .....
B) Presence of Mosquito: Moderate presence of mosquitoes .....
C) Others factors: High tick challenge, Short rains from Nov to 1st Week January and Long rains from Mid March to June .....

III. Clinical Information on Herd:

A) Number of animals affected: .....
B) Signs and Symptoms observed:
Fever:Yes. .....
Vomiting:. .....
Diarrhoea:Yes, some cases.....
Bleeding: .....
Nasal Discharge:Yes.....
Cough:Yes .....
Jaundice: .....
Anemia:Yes ....
Abortion:Yes (in cattle and goats) .....
Lameness:. .....
Other Symptoms:L N Swelling .....
C) Received Treatment or Vaccination: Treatment with butalex and Antibiotics.....
D) Other informations : Presence of wildlife(wildebeeste, Zebra).....

VI. Laboratory Specimen Information:

A) Type of Specimen:

Blood (for serology): 30 sera of Young zebu Cattle and were tested in Virilogy srevice in Dakar, Senegal
Blood (for virus isolation). .....
Organs:. .....
Others:. .....

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	**Serology Fvr** Do elisa IgM (titer VN)	Observations
1	TZ 440				0.031	
2	TZ 437				0.045	
3	TZ 438				0.162	
4	TZ 439				0.05	
5	TZ 1080				0.233 (80)	
6	TZ 1079				0.027	
7	TZ 1070				0.014	
8	TZ 1067				0.096	
9	TZ 1069				0.029	
10	TZ 1068				0.035	
11	TZ 1078				0.026	
12	TZ 1077				0.031	
13	1587				0.024	
14	TZA 47				0.02	
15	TZ 1061				0.02	
16	TZ 1062				0.123	
17	TZ 1063				0.28	
18	TZ 1064				0.051	
19	TZ1065				0.000	
20	TZ 1066				0.035	
21	TZ 1071				0.027 (160)	
22	TZ 1072				0.058	
23	TZ 1073				0.043	
24	TZ 1074				0.044	
25	TZ 1075				0.046	
26	TZ 1076				0.034	
27	TZ 1038				0.086	
28	TZ 1036				0.017	
29	TZ 1040				0.03	
30	TZ 1594				0.005	
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

C) Notes:

Poor condition of animals due to draught... ....

All sera tested were negative in IgM antibodies and two sera were positive in VN antibodies, no indicative of recent viral disease

This Form Was completed by : Name et Function: Maulidi Yusufu P.O.BOX 3044, Simanjiro Emberet, Arusha, Tanzania... ... ... ___ ... ___

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institute
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 015 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

IV. **Date**:...14.12.1999.....

II. Owner information:

A) Name:Donald Tilisho. .....
B) Residence: Village or Farm:KNCU Molomo ..... District: Hai .....
Province or Region:Kilimanjaro .....

III. Herd information:

A) Total Number:. .....
B) Species: Goat:O..... Sheep:O : ..... Cattle:280 ....Other:. .....
C) Production:Dairy Production (Ayshire breed) .....

IV. Environment information:

A) Climate or Vegetation:Forest and Grassland...Rainfall: 500-750 mm (el nino 900-1200 mm) .....
Latitude: 03°09 25 South ..... Longitude:37°03 21 East .....
Altitude:1 276 metres ..... Temperature: .....
B) Presence of Mosquito:High Challenge .....
C) Others factors:High Tick Challenge .....

IV. Clinical Information on Herd:

A) Number of animals affected: .....
B) Signs and Symptoms observed:
Fever:Yes .....
Vomiting:. .....
Diarrhoea:Yes (in calves) .....
Bleeding:. .....
Nasal Discharge:Yes.....
Cough: .....
Jaundice:Yes .....
Anemia:Yes .....
Abortion:Yes (during el nino). .....
Lameness:Yes (in weaners and heifers) .....
Other Symptoms: .....
C) Received Treatment or Vaccination:vaccination for ECF, Treatmant for Anaplasma and babesia
D) Other informations :Mixed farm including Dairy, Coffe, Wheat and maize .....

VI. Laboratory Specimen Information:

A) Type of Specimen:

Blood (for serology):30 sera of young dairy cattle Ayshire breed and were tested for ElisaIgM and VN tests in Virology Service in Dakar, Sénégal
Blood (for virus isolation).. ... ... __ ... ...
Organs:. .. .. ___ ... ___ .. ... __
Others:... .. ___ ... ... ___ ... ...

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	Serology Fvr Do IgM (Titer VN)	Observations
1	9023	Ayshire	1	F	0.051 (320)	
2	160	Ayshire	1	F	0.105	
3	159	Ayshire	1	F	0.014	
4	5026	Ayshire	1	F	0.019	
5	5028	Avshire	1	F	0.02	
6	9026	Ayshire	1	F	0.053	
7	7815	Ayshire	1	F	0.045 (320)	
8	9025	Ayshire	1	F	0.046	
9	5019	Ayshire	1	F	0.027	
10	148	Avshire	1	F	0.059	
11	9020	Ayshire	1	F	0.048	
12	7826	Ayshire	1	F	0.016	
13	158	Ayshire	1	F	0.040	
14	7825	Ayshire	1	F	0.025 (160)	
15	5022	Ayshire	1	F	0.032	
16	7827	Ayshire	1	F	0.072	
17	157	Ayshire	1	F	0.013	
18	147	Ayshire	1	F	0.03	
19	8025	Ayshire	1	F	0.051	
20	179	Ayshire	1	F	0.025	
21	178	Ayshire	1	F	0.005	
22	176	Ayshire	1	F	0.083	
23	170	Ayshire	1	F	0.027	
24	164	Ayshire	1	F	0.023	
25	173	Ayshire	1	F	0.023	
26	1025	Ayshire	1	F	0.038	
27	165	Ayshire	1	F	0.004	
28	166	Ayshire	1	F	0.019	
29	177	Ayshire	1	F	0.009	
30	168	Avshire	1	F	0.051	
31						
32	Serum Positive				1.000	
33	Negative Serum				0.020	
34						
37						
38						
39						

C) Notes:
The farm was very affected the 1997 RVF outbreak
All sera tested were negative in ElisaIgM but three sera were positive in VN tests at high level. no indicative of recent viral infection

This Form Was completed by : Name et Function: Donald M Tilisho (L.F.O) Ltd, P.O.BOX 28, Sanyajuu, Tanzania

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Central Veterinary Laboratory
Virology Section, P.O.BOX Kabeté
Nairobi, Kenya Tel: 2554 02 63 13 90, Fax 254 02 63 12 73,
E mail: macharia_joeph_mwangi@hotmail.com

HERD Investigation Form for Rift Valley Fever Surveillance

V. Date:...1.12.1999..... .....

II. Owner information:

A) Name:Puis M Ndosi, Farm Manager, veterinary Farm of Machakos, P 0 BOX 311, Machakos, Kenya, Tel 0145 21 500.....
B) Residence: Village or Farm:Veterinary Farm of machakos... ..District:Machakos .....
Province or Region:Eastern .....

III. Herd information:

A) Total Number: .....
B) Species: Goat:O ....Sheep:114 :...Cattle:99..... ..Other: .....
C) Production:Dairy Cattle(Breed Gemsey, Ayshire, sahiwal).....

IV. Environment information:

A) Climate or Vegetation:Savanna and galery forestRainfall: .....
Latitude: 1° 30 00 South ..... Longitude: 37°20 00 East .....
Altitude: 1646 metres ..... .Temperature:. .....
B) Presence of Mosquito:High mosquitoes challenge .....
C) Others factors:Presence of tse-tse flies.....

V. Clinical Information on Herd:

A) Number of animals affected:.....
B) Signs and Symptoms observed:
Fever:.....
Vomiting:.....
Diarrhoea:.....
Bleeding:. .....
Nasal Discharge: .....
Cough:. .....
Jaundice: .....
Anemia:. .....
Abortion:. .....
Lameness: .....
Other Symptoms: .....
C) Received Treatment or Vaccination: .....
D) Other informations :.....

VI. Laboratory Specimen Information:

A) Type of Specimen:

Blood (for serology): 30 sera-of Young dairy cattle (cross breed) born after september 1998 and are kept at -20 °C in Kabete Veterinary Laboratory and not tested yet.
Blood (for virus isolation)... . .. . . ___ ... ... __ .. ..
Organs:. ... ... ___ .. .. __ .. ... ___ ... .. ___ ... ___
Others:. .. ..

B) List Of sera for RVF serology for sentine1 Herd:

Lab No.	Tag No.	Species	Age (Year)	Sexe	Serology Fvr O.D Elisa IgM (Titer VN)	Observations
1	1737	Aryshire	1	F		
2	1741	Aryshire	1	F		
3	1727	Sahiwal	2	F		
4	1721	Sahiwal	2	F		
5	1682-1	Friesian	1	F		
6	1742	Aryshire	1	F		
7	1736	Aryshire	1	F		
8	1740	Aryshire	1	F		
9	1745	Aryshire	1	F		
10	1609	Aryshire	4 years 1/2	F		
11	L 714	Aryshire	2 years 1/2	F		
12	1733	Aryshire	1	F		
13	1735	Aryshire	1	F		
14	1720	Sahiwal	2	F		
15	1719	Friesian	2	F		
16	1732	Sahiwal	1	F		
17	1729	Friesian	1years 1/2	F		
18	1738	Aryshire	1	F		
19	1743	Aryshire	1	F		
20	1744	Aryshire	1	F		
21	1683	Aryshire	3	F		
22	1789	Friesian	2 years 1/2	F		
23	1739	Friesian	1	F		
24	1711	Friesian	2	F		
25	1660-1	Friesian	2	F		
26	1709	Friesian	2	F		
27	1592	Aryshire	4	F		
28	1745	Aryshire	1	F		
29	P 4	Sahiwal	2 years 1/2	F		
30	1724	Friesian	2	F		
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

C) Notes:
The 1997-1998 RVF outbreak caused abortions and mortalities in this dairy farm. The 30 sera are not tested.

.....

.....

.....

This Form Was completed by : Name et Function: Mr Pius M Ndosi, farm Manager, Veterinary Farm of Machakos, P 0 Box 311, Machakos, Kenya, Tel 0145 21 500

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Central Veterinary Laboratory
Virology Section, P.O.BOX Kabete
Nairobi, Kenya Tel: 2554 02 63 13 90, Fax 254 02 63 12 73,
E mail: macharia_joeph_mwangi@hotmail.com

HERD Investigation Form for Rift Valley Fever Surveillance

I. Date:...02.12.1999.. .....

II. Owner information:

A) Name:Samuel N Ole Sinkeet Hsc, Centre director, NAHRC, Naivasha, P 0 Box 25, Naivasha, Kenya., ...
B) Residence: Village or Farm:NAHRC Veterinary farm.. ..District:Nakuru .....
Province or Region:Rift Valley .....

III. Herd information:

A) Total Number: .....
B) Species: Goat: ..... Sheep: : ....Cattle:..... Other: .....
C)
Production:Dairy.....
.....

IV. Environment information:

A) Climate or Vegetation:Savanna ....Rainfall:
.....
Latitude: ..... Longitude: .....
Altitude: ..... .Temperature: .....
B) Presence of Mosquito:high mosquitoes challenge .....
C) Others factors: a iot of ticks.....

II. Clinical Information on Herd:

A) Number of animals affected:.....
B) Signs and Symptoms observed:
Fever:.....
Vomiting:. .....
Diarrhoea:..... .....
Bleeding:. .....
Nasal Discharge:. .....
Cough:. ....
Jaundice: ....
Anemia:..... .....
Abortion:..... ... .
Lameness:. ....
Other Symptoms: ....
C) Received Treatment or Vaccination:.....
D) Other informations :..... .....

VI. Laboratory Specimen hiformation:

A) Type of Specimen:
Blood (for serology):30 sera were collected but not tested yet. They are kept at -20°C in Kabete Veterinary Laboratory ,Nairobi
Blood (for virus isolation)..... ....
Organs:. ....
Others: ....

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	Serology (VN, Elisa IgG- Elisa IgM, IHA)	Observations
1	2029	Friesian		F		
2	2031	Friesian	1	F		
3	2034	Friesian	1	F		
4	2028	Friesian	1	F		
5	2035	Friesian	1	F		
6	2071	Friesian	1			
7	2039	Friesian	1	F		
8	2042	Friesian	1	F		
9	2046	Friesian	1	F		
10	2050	Friesian	1	F		
11	2051	Friesian	1	F		
12	2052	Friesian	1	F		
13	2055	Friesian	1	F		
14	2056	Friesian	1	F		
15	2065	Friesian	1	F		
16	8375	Sahiwal	1	F		
17	8380	Sahiwal	1	F		
18	8384	Sahiwal	1	F		
19	8390	Sahiwal	1	F		
20	8399	Sahiwal.	1	F		
21	8487	Sahiwal	1	F		
22	8418	Sahiwal	1	F		
23	8433	Sahiwal		F		
24	8367	Sahiwal	1	F		
25	8325	Sahiwal	1	F		
26	8408	Sahiwal	1	F		
27	8342	Sahiwal	1	F		
28	8423	Sahiwal	1	F		
29	8443	Sahiwal	1	F		
30	8409	Sahiwal	1	F		
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

C) Notes:

RVF outbreak in 1997-I 998 in the rift Valley

The sera were not tested.

This Form Was completed by : Name et Function: Dr S.N.O. Sinkeet, Hsc, Centre director, NAHRC, Naivasha, P 0 Box 25, Naivasha, kenya... . . . . .

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Central Veterinary Laboratory
Virology Section, P.O.BOX Kabeté
Nairobi, Kenya Tel: 2554 02 63 13 90, Fax 254 02 63 12 73,
E mail: macharia_joeph_mwangi@hotmail.com

HERD Investigation Form for Rift Valley Fever Surveillance

VI. Date:...04.12.1999.....

II. Owner information:

A) Name: Dr Lucy Kamou, DVO Of thika or Dr Mbutiti, Deputy DVO, Thika, Kenya .....
B) Residence: Village or Farm:Sukari Ranch ....District:Thika .....
Province or Region:Central... .....

III. Herd information:

A) Total Number.....
B) Species: Goat:. ..... .Sheep: :..... Cattle:. ..... Other:. .....
C) Production: .....

IV. Environment information:

A) Climate or Vegetation: ....Rainfall: .....
Latitude: 1 ^{0} 00 00 south ..... Longitude: 37" 00 00 East .....
Altitude: ..... .Temperature: ....
B) Presence of Mosquito: ....
C) Others factors: ....

III. Clinical Information on Herd:

A) Number of animals affected: .....
B) Signs and Symptoms observed:
Fever:. .....
Vomiting: .....
Diarrhoea' ....
Bleeding:. .....
Nasal Discharge: .....
Cough: .....
Jaundice: .....
Anemia:. .....
Abortion: .....
Lameness:. .....
Other Symptoms: .....
C) Received Treatment or Vaccination: .....
D) Other informations :.....

VI. Laboratory Specimen Information:

A) Type of Specimen:
Blood (for serology): 30 sera of young tagged cattle born after the 1997-I 998 RVF outbreak and are kept at -20°C in Kabete Veterinary Laboratory In Kabete...
Blood (for virus isolation).. .. .. ___ ... ...
Organs:. .. ..
Others:. .. ..

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	Serology (VN, Elisa IgG- Elisa IgM, IHA)	Observations
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34	t	- - - - - Y -				
35						
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38						
39						
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C) Notes:
The site ws visted by the team the November 30th, 99 but not sampled during the visit.
These 30 animals are bleeded and tagged by Dr Mbugua and his team after my de parture from Kenya to tanzania
The list of sera are kept in Laboratory Veterinary Laboratory in Kabete (with Dr Mbugua, investigation Officer)
The sera are kept in -20°C in kabete Veterianry Laboratory and not tested yet.

This Form Was completed by : Name et Function:

The informations are avalaible in Veterinary Laboratory in Kabete , Dr Mbugua, Investigation Officer, P 0 BOX Kabete, Nairobi, Kenya.

Annexe VI.

Herd Investigation Form for Rift Valley Fever surveillance

Animal Diseases Research Institute
Virology Department
P.O.BOX 9254
Dar-es-Salaam
Tel: 255 015 864369
E mail: Virology@raha.com

HERD Investigation Form for Rift Valley Fever Surveillance

VII. Date:...3.12.1999.....

II. Owner information:

A) Name:... DVO of kitale... ... ... ___ ... .
B) Residence: Village or Farm: Macheo Farm ltd. ,, ..District: Eldoret-Kitale
Province or Region: North Rift Valley

III. Herd information:

A) Total Number: .....
B) Species: Goat: ....Sheep: : ..... Cattle: ..... Other:. .....
C) Production: .....

IV. Environment information:

A) Climate or Vegetation: ..... Rainfall: .....
Latitude: 1" 00 00 North ....Longitude: 35° 00 00 eassi .....
Altitude: 1893 metres..... Temperature: .....
B) Presence of Mosquito: .....
C) Others factors: .....

IV. Clinical Information on Herd:

A) Number of animals affected: .....
B) Signs and Symptoms observed:
Fever: .....
Vomiting:. .....
Diarrhoea: .....
Bleeding:. .....
Nasal Discharge:. .....
Cough:. .....
Jaundice:. .....
Anemia:. ....
Abortion: .....
Lameness: ....
Other Symptoms: ....
C) Received Treatment or Vaccination: .....
D) Other informations :... .....

VI. Laboratory Specimen Information:

A) Type of Specimen:
Blood (for serology):... . ... __ ... .
Blood (for virus isolation)... ... ... ___ ... ... ___ ...
Organs:. . .. .
Others:. .. . . . __ ___ . ...

B) List Of sera for RVF serology for sentinel Herd:

Lab No.	Tag No.	Species	Age	Sexe	Serology (VN, Elisa IgG- Elisa IgM, IHA)	Observations
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
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24						
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35						
36						
37						
38						
39						
40						

C) Notes:
The animals in this private farm are tagged and are surveyed by the DVO of Kitale.The aniamls are bleeded by the DVO of Kitale who is equiped in tubes and needles during our visit on December 3 th 99 in Kitale

This Form Was completed by : Name et Function:

The list of samples are kept by Dr Mbugua in Kabete veterinary laboratory, in Nairobi.