

Source: **KENYA AGRICULTURAL RESEARCH SERVICE** submitted to **CRIS**

**EXPANSION OF THE KENYAN RIFT VALLEY FEVER (RVF) VETERINARY SURVEILLANCE PROGRAM TO INCLUDE WILDLIFE SPECIES**

<b>Sponsoring Institution</b>	Agricultural Research Service/USDA	<b>Project Status</b>	TERMINATED
		<b>Funding Source</b>	USDA COOPERATIVE AGREEMENT
<b>Reporting Frequency</b>	Annual	<b>Accession No.</b>	0412497
<b>Grant No.</b>	(N/A)	<b>Project No.</b>	5430-32000-001-02S
<b>Proposal No.</b>	(N/A)	<b>Multistate No.</b>	(N/A)
<b>Program Code</b>	(N/A)	<b>Project Start Date</b>	Sep 1, 2007
<b>Project End Date</b>	Jan 31, 2012	<b>Grant Year</b>	(N/A)

**Project Director**

WILSON W C

**Recipient Organization**

KENYA AGRICULTURAL RESEARCH SERVICE  
BIOTECHNOLOGY CENTER  
NAIROBI,null null

**Performing Department**

(N/A)

**Non Technical Summary**

(N/A)

**Animal Health Component** 60%

**Research Effort Categories**

Basic 20%  
Applied 60%  
Developmental 20%

**Classification**

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
311	3410	1101	33%
311	3610	1090	33%
311	3310	1090	34%

Knowledge Area

311 - Animal Diseases;

**Subject Of Investigation**

3610 - Sheep, live animal; 3310 - Beef cattle, live animal; 3410 - Dairy cattle, live animal;

**Field Of Science**

1101 - Virology; 1090 - Immunology;

**Keywords**

[rift](#)

[valley](#)

[fever](#)

[rvf](#)

[veterinary](#)

[diagnostic](#)

[wildlife](#)

**Goals / Objectives**

The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species.

**Project Methods**

The ongoing veterinary surveillance will be expanded by the inclusion of wildlife sero-surveillance in Kenya. The project will also evaluate the newly developed RVF LAMP diagnostic test developed by mutual FAO/IAEA collaborators. KARI will archive veterinary surveillance samples collected and assayed using existing diagnostic technology as part of their ongoing projects. The ABADRL has collected and stored serum and tissue samples from wild rodents in Kenya at the end of the 2006-2007 RVF outbreak. This was accomplished through a collaboration with USDA, APHIS, National Wildlife Research Center (NWRC), US Army Medical Research Unit-Kenya (USAMRU-K) and Kenya Medical Research Institute (KEMRI). The ABADRL scientists will work with KARI scientists in Kenyan facilities to gain experience with existing diagnostics, perform the analysis of the wild rodent samples using current assays, and assist in the evaluation of the LAMP diagnostic test. The ABADRL, KARI and mutually agreed upon collaborating scientists with the assistance of the USDA, APHIS, Centers for Epidemiology and Animal Health (CEAH) will consolidate the information generated in this project with the existing data to initiate the development of a comprehensive epidemiological understanding of RVF in Kenya.

**Progress** 09/01/07 to 01/31/12

**Outputs**

Progress Report Objectives (from AD-416): The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species. Approach (from AD-416): The ongoing veterinary surveillance will be expanded by the inclusion of wildlife sero-surveillance in Kenya. The project will also evaluate the newly developed RVF LAMP diagnostic test developed by mutual FAO/IAEA collaborators. KARI will archive veterinary surveillance samples collected and assayed using existing diagnostic technology as part of their ongoing projects. The ABADRL has collected and stored serum and tissue samples from wild rodents in Kenya at the end of the 2006-2007 RVF outbreak. This was accomplished through a collaboration with USDA, APHIS, National Wildlife Research Center (NWRC), US Army Medical Research Unit- Kenya (USAMRU-K) and Kenya Medical Research Institute (KEMRI). The ABADRL scientists will work with KARI scientists in Kenyan facilities to gain experience with existing diagnostics, perform the analysis of the wild rodent samples using current assays, and assist in the evaluation of the LAMP diagnostic test. The ABADRL, KARI and mutually agreed upon collaborating scientists with the assistance of the USDA, APHIS, Centers for Epidemiology and Animal Health (CEAH) will consolidate the information generated in this project with the existing data to initiate the development of a comprehensive epidemiological understanding of RVF in Kenya. The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley Fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species. There is a need to develop a quick non-tissue culture dependent method for diagnosis of Rift Valley fever and this project evaluated a newly developed Reverse transcriptase (RT)-PCR as a method for laboratory diagnosis of Rift Valley fever virus infection. The RT-PCR a based test was compared to another newly developed LAMP PCR assay. In addition, evaluation of ELISA based diagnostic tests was conducted but failed due to reagents being damaged in shipment. The data generated was also used to improve the understanding of the epidemiology of RVF in Kenya.

**Impacts**

(N/A)

**Publications**

**Progress** 10/01/10 to 09/30/11

### Outputs

Progress Report Objectives (from AD-416) The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species. Approach (from AD-416) The ongoing veterinary surveillance will be expanded by the inclusion of wildlife sero-surveillance in Kenya. The project will also evaluate the newly developed RVF LAMP diagnostic test developed by mutual FAO/IAEA collaborators. KARI will archive veterinary surveillance samples collected and assayed using existing diagnostic technology as part of their ongoing projects. The ABADRU has collected and stored serum and tissue samples from wild rodents in Kenya at the end of the 2006-2007 RVF outbreak. This was accomplished through a collaboration with USDA, APHIS, National Wildlife Research Center (NWRC), US Army Medical Research Unit- Kenya (USAMRU-K) and Kenya Medical Research Institute (KEMRI). The ABADRU scientists will work with KARI scientists in Kenyan facilities to gain experience with existing diagnostics, perform the analysis of the wild rodent samples using current assays, and assist in the evaluation of the LAMP diagnostic test. The ABADRU, KARI and mutually agreed upon collaborating scientists with the assistance of the USDA, APHIS, Centers for Epidemiology and Animal Health (CEAH) will consolidate the information generated in this project with the existing data to initiate the development of a comprehensive epidemiological understanding of RVF in Kenya. This project goal is to provide a better epidemiological understanding of RVF and the importance of wildlife in disease maintenance as well as enhance development and evaluation of new diagnostic technologies. A total of 986 serum samples were collected and analyzed from farms in Molo, (where no outbreaks has ever been previously reported), Naivasha, (an RVF-endemic area and where the first case of RVF was reported in Kenya), Kajiado, (where there had been reports of an RVF-like disease) and Shompole, (a chief trans migratory livestock-route and market on the Kenya/Tanzania border). Of the total sera tested, 16.94% (164/966), 8.42% (81/966) and 4.13% (39/966) were found to be positive by IgG-sandwich enzyme-linked immunosorbent assay (ELISA), IgM-capture ELISA and serum neutralization (SN) tests respectively. A total of 920 wildlife serum samples were obtained from Veterinary Laboratories in Kabete, Kenya, 500 of which had been collected just before and during the latest outbreak while 420 samples had been collected after the outbreak. A total of 113 rodent samples were received from CDC Kisumu and analysis is ongoing. The serum samples were coded and stored in aliquots at -80oC. A field-trip was conducted that demonstrated the ability to run the qRT-PCR assay in the field. These samples are archived for future test evaluation and generate support for continued pursuance of rapid detection technology. This research supports NP103 Action Plan Components 1. Biodefense Research and 3. Prevent and Control Zoonotic Diseases. ADODR is directly involved in performance of the research and also monitors activities to evaluate research progress through site visits, meeting at conferences and through email and phone calls.

### Impacts

(N/A)

### Publications

**Progress** 10/01/09 to 09/30/10

### Outputs

Progress Report Objectives (from AD-416) The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species. Approach (from AD-416) The ongoing veterinary surveillance will be expanded by the inclusion of wildlife sero-surveillance in Kenya. The project will also evaluate the newly developed RVF LAMP diagnostic test developed by mutual FAO/IAEA collaborators. KARI will archive veterinary surveillance samples collected and assayed using existing diagnostic technology as part of their ongoing projects. The ABADRL has collected and stored serum and tissue samples from wild rodents in Kenya at the end of the 2006-2007 RVF outbreak. This was accomplished through a collaboration with USDA, APHIS, National Wildlife Research Center (NWRC), US Army Medical Research Unit- Kenya (USAMRU-K) and Kenya Medical Research Institute (KEMRI). The ABADRL scientists will work with KARI scientists in Kenyan facilities to gain experience with existing diagnostics, perform the analysis of the wild rodent samples using current assays, and assist in the evaluation of the LAMP diagnostic test. The ABADRL, KARI and mutually agreed upon collaborating scientists with the assistance of the USDA, APHIS, Centers for Epidemiology and Animal Health (CEAH) will consolidate the information generated in this

project with the existing data to initiate the development of a comprehensive epidemiological understanding of RVF in Kenya. This project goal is to provide a better epidemiological understanding of RVF and the importance of wildlife in disease maintenance as well as enhance development and evaluation of new diagnostic technologies. Over 500 samples from sheep and goats were collected from farms in and around Ol-Magogo. All of these samples were tested with IgG ELISA (BDSL), 19. 75% were found to have antibodies. A total of 200 samples were tested with the qPCR all were negative, though the positive control worked every time. IgM and inhibition ELISA kits were not available due to the outbreak in South Africa, as soon as these are available, all the samples will be tested with these as well. A new protocol for LAMP was provided by IAEA and is being established in the lab currently. A total of 113 rodent samples were received from CDC Kisumu and analysis is ongoing. A field-trip was conducted that resulted in the collection of collection of 600 field samples and demonstration that the qRT-PCR assay can be performed in the field will enhance future test evaluation and generate support for continued pursuance of this technology. This research supports NP103 Action Plan Components 1. Biodefense Research and 3. Prevent and Control Zoonotic Diseases. ADODR is directly involved in performance of the research and also monitors activities to evaluate research progress through site visits, meeting at conferences and through email and phone calls.

**Impacts**

(N/A)

**Publications****Progress** 10/01/07 to 09/30/08**Outputs**

Progress Report Objectives (from AD-416) The primary objective of this project is to evaluate the LAMP test for RVF and to expand our knowledge about Rift Valley fever (RVF) epidemiology in Kenya by expanding the ongoing Kenya veterinary surveillance program to include wildlife species. Approach (from AD-416) The ongoing veterinary surveillance will be expanded by the inclusion of wildlife sero-surveillance in Kenya. The project will also evaluate the newly developed RVF LAMP diagnostic test developed by mutual FAO/IAEA collaborators. KARI will archive veterinary surveillance samples collected and assayed using existing diagnostic technology as part of their ongoing projects. The ABADRL has collected and stored serum and tissue samples from wild rodents in Kenya at the end of the 2006-2007 RVF outbreak. This was accomplished through a collaboration with USDA, APHIS, National Wildlife Research Center (NWRC), US Army Medical Research Unit- Kenya (USAMRU-K) and Kenya Medical Research Institute (KEMRI). The ABADRL scientists will work with KARI scientists in Kenyan facilities to gain experience with existing diagnostics, perform the analysis of the wild rodent samples using current assays, and assist in the evaluation of the LAMP diagnostic test. The ABADRL, KARI and mutually agreed upon collaborating scientists with the assistance of the USDA, APHIS, Centers for Epidemiology and Animal Health (CEAH) will consolidate the information generated in this project with the existing data to initiate the development of a comprehensive epidemiological understanding of RVF in Kenya. Significant Activities that Support Special Target Populations This project was initiated to provide a better epidemiological understanding of RVF and the importance of wildlife in disease maintenance as well as enhance development and evaluation of new diagnostic technologies. A collection of 300 wildlife sera have been collected and are currently being evaluated with existing RVF ELISA. In addition, development of a Loop Mediated Isothermal Amplification Protocol (LAMP) for RVF diagnosis has been initiated. This research supports NP103 Action Plan Components 1. Biodefense Research and 3. Prevent and Control Zoonotic Diseases. ADODR is directly involved in performance of the research and also monitors activities to evaluate research progress through site visits, meeting at conferences and through email and phone calls.

**Impacts**

(N/A)

**Publications**