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Summary

Rift Valley fever (RVF) is a zoonotic viral disease. It was first recognized in the Rift Valley of East Africa, but it is now recognized to be an endemic disease affecting most of Sub-Saharan Africa and Madagascar. Since 1970, on occasion, it has shown an ability to spread northwards causing epidemics in Egypt, Yemen and Saudi Arabia. It is considered an emerging pathogen and a select agent. The disease in most humans is characterized by fever and malaise, but a small percentage of patients develop fatal encephalitis and/or generalized hemorrhage. In animals, the disease is particularly severe in lambs and calves, which die of generalized hemorrhage; pregnant animals commonly abort. RVF is transmitted by several species of mosquito, but human infection is often associated with the slaughter of infected animals. Experimental studies have established that US species of mosquito can transmit the virus. It is feared that the RVF virus, if introduced accidentally or through bioterrorism, could have a greater impact than West Nile virus on the animal and human populations of North America.

The following report is a result of a three day multi-agency disease outbreak exercise and evaluation, with a focus on collaboration between stakeholders, as held for the state of Florida from 18-20 November 2008 in the State Emergency Operations Centre (SEOC) in Tallahassee. The exercise was a collaborative effort between the Florida Department of Agriculture and Consumer Services (FDACS), the University of Florida (College of Veterinary Medicine) and the State Emergency Response Team (SERT). As far as could be researched, this was the first exercise ever held dealing with a Rift Valley fever outbreak on a state wide, multi-agency scale. The exercise was in large part a so called 'table-top' exercise, but field components were added to try to make it as challenging and realistic as possible for the involved stakeholders.

The overall exercise goal, as set by the Exercise Planning Team early on in the organization, is the following:

Goal: *'To develop a relevant exercise to raise awareness about the need to quickly identify and control an outbreak of Rift Valley fever and effectively train the capabilities of multiple stakeholders in the state of Florida and the Federal government to collaborate in responding to an introduction of Rift Valley fever virus into Florida'*

The report itself consists of 3 parts. Part 1 deals with why there was a need for this exercise and why Rift Valley fever (RVF) virus was selected as the causative agent. Part 2 will then give an overview of the scenario and organization of the exercise. Finally part 3 will provide an evaluation and discussion in which the following hypotheses will be either accepted or rejected. At last, this report will identify potential areas for improvement for future exercises and actions in case of an actual outbreak of Rift Valley fever.

Hypotheses:

H0: *The Rift Valley fever exercise, as held for the state of Florida from 18-20 November 2008, was successful because it was an educative, challenging and workable exercise which raised the awareness about the threat of a Rift Valley fever outbreak to Florida besides also identifying strengths and weaknesses concerning intra- and interagency communications during a Rift Valley fever outbreak of bioterrorist origin.*

H1: The Rift Valley fever exercise, as held for the state of Florida from 18-20 November 2008, was not successful because it was not an educative, challenging and workable exercise which raised the awareness about the threat of a Rift Valley fever outbreak to Florida besides also identifying strengths and weaknesses concerning intra- and interagency communications during a Rift Valley fever outbreak of bioterrorist origin.

To be able to accept or reject the H0, the following exercise objectives have been formulated; if these objectives are accomplished by the end of this report the H0 can be accepted. Specific objectives of the exercise were to:

1. Give the participants an opportunity to learn about response actions when a bioterrorist event is suspected,
2. Give participants an opportunity to learn about the biological complexity of Rift Valley fever,
3. Have participants explore issues surrounding current diagnostic and response capabilities to Rift Valley fever currently available in the United States,
4. Have participants explore issues surrounding multi-agency crisis communication efforts involving a vector-borne zoonotic disease incident,
5. Have participants acquire an increased awareness of disease response issues associated with a vector-borne disease.
6. Review the strengths and weaknesses of the exercise as brought forth by the expert reviewers and participants,
7. Identify potential areas for improvement for future exercises and actions in case of an actual outbreak of Rift Valley fever.

A written evaluation of the exercise was provided by the Expert Panel and participants.

The following positive aspects were identified

- The exercise was well organized and sufficiently challenged the participants.
- The exercise produced a heightened awareness among participants of the ecological and economic threats of RVF to Florida
- The exercise educated the participants on issues surrounding both the control of a vector-borne zoonotic disease outbreak and a potential bioterrorist act.
- The use of real locations, real-time events, video and actors in the scenario increased the authenticity of the scenario and participants' motivation to engage in the scenario.
- Inter-group and inter-agency communication improved as the exercise proceeded, and the importance of this communication was observed and noted by the participants.

- The Florida State Emergency Operations Center was a very effective location for the exercise.
- The video conference with Dr. Koos Coetzer enlightened the participants on RVF in endemic situations and established a sense of the complexity and seriousness of the problems caused by an introduction of RVF into the United States.

The following were areas identified for improvement:

- The exercise highlighted the need for better communication between different agencies in a vector-borne zoonotic disease outbreak.
- There was some initial uncertainty on the part of the participants about what was expected of them in the exercise. Some participants felt that there was insufficient time allotted between situation updates to work through the scenario.
- Some felt that all participants should have been organized within the ICS to better facilitate communication between groups. An expansion of the ICS to easily incorporate pertinent experts may need to be considered.
- Although the scenario planning team emphasized that the questions at the end of each situation update in the workbook were included only to stimulate discussion, many participants commented that the questions distracted them from the exercise.
- The exercise highlighted the need for agency protocols and policies to address vector-borne zoonotic disease outbreaks.

Prior to the participants meeting in the State Emergency Operations Center (SEOC) in Tallahassee, November 18-20, 2008 the exercise was code named Blue Mountain Fever. This pseudonym was used to avoid potential misunderstanding that a real outbreak of Rift Valley Fever (RVF) had occurred in Florida. All participants were aware that the exercise was to focus on RVF.

Part 1 – Why the need for this exercise?

One Health Momentum

At the end of the 19th and the beginning of the 20th century, well established leaders of both the veterinary and human medical communities had a great appreciation for the concept that their two worlds were intrinsically connected. Since its origin, the veterinary education and legislation is based upon the organized control of animal diseases to be able to promote the health and welfare of humans. The visionary idea of ‘thinking outside the borders of ones one area’ was embraced by well known scientists like the German physician and pathologist Dr Rudolf Virchow (1821-1902) and the Canadian physician William Osler (1849-1919). To quote the first: ‘between animal and human medicine there are no dividing lines – nor should there be. The object is different but the experience obtained constitutes the basis of all medicine’ (Kahn, Kaplan, & Steele, 2007).

In the course of the 20th century, this line of thought has developed less progressively than these visionaries probably would have hoped for. Cooperation between the veterinary and human medical societies is still in an unorganized stage; because of extensive isolationistic working methods chances to benefit from each others knowledge and to promote efficiency are being overlooked. Especially in the field of the zoonoses research and control there is a mutual under appreciation and ignorance about what the two worlds could mean for each other.

That the veterinary and medical communities could benefit from each other is underlined by Dr Calvin W. Schwabe. In the 1960s this veterinary epidemiologist and parasitologist at the University of California, Davis, introduced the concept of ‘One Medicine’ which attempts to promote the unified veterinary and human approach to the control of zoonotic diseases.

It almost seems inevitable that the amount of zoonotic disease outbreaks will increase in the 21st century. It is being estimated that 75% of the present emerging diseases in humans have a zoonotic origin. Risk factors in this scenario are, amongst others, an extensive increase in global trade and tourism; the speed of mass transport (shorter than the incubation period of a disease); the exposure to new pathogens by disruption of ecosystems (strong population growth and more contact with wildlife) and more intensive agriculture. Fast pace developing countries like China and India will contribute to the fact that these risk factors will be of even more relevance in the ongoing of the 21st century.

To achieve a more efficient and fast way to control an outbreak of a zoonotic disease, the necessity arises to more multi-agency cooperation in a variety of fields. Within the biomedical en veterinary research areas more cooperation should exist in order to get a broader understanding of the infectious agents they are trying to understand. Within the veterinary and medical education students should be made more aware of the fact that they will be working in a more complex and interconnected world then in which their clergymen conducted their profession. Within the public health and animal health governmental fields stakeholders should collaborate more to be able to rapidly respond to the zoonotic disease challenges they together face.

Why was RVF selected as a causative agent?

Historic Background

The September 2001 attacks on the World Trade Centre and the Pentagon followed by the intentional release of Anthrax spores in the federal buildings changed the government's attitude to intentional biological threats.

Global events including the 2001 Foot-and-mouth disease outbreak in Europe, the 2003 Severe acute respiratory syndrome (SARS) outbreak, the 2003 BSE outbreak in the USA and the 2004 and 2005 Avian Influenza infestation in south-east Asia have created awareness about a possible bioterrorism use of these agents.

When in 1999 West Nile Virus (WNV) entered the USA and rapidly spread over the continent, stakeholders were made aware of the fact that the country is very vulnerable to an outbreak of such a vector borne virus, previously unknown to the Western Hemisphere. The delay in recognizing the encephalitis epidemic in humans in New York and identification of the WNV led to problems with response and control. By 2004 the virus had spread widely over the USA, several provinces of Canada and south to the Caribbean and Mexico (Gibbs, 2005).

All these factors together have made it possible to identify the strengths and weaknesses of the US public health and animal health systems and have led to great investments in these fields.

The preparedness for a possible outbreak of Rift Valley fever virus (RVF), having some similarity with WNV in it also being a mosquito-borne virus, could have benefited from the funds invested in WNV control systems. Unfortunately, these funds are being repositioned with the coming of new threats. Also, the approach to emerging disease threats in general can be improved. As Britch et al. (2007) state in their article there are two key shortfalls in this approach: '1) US public health and animal health agencies have become reactive rather than proactive – new committees and infrastructure are formed to deal with new threats and wheels are reinvented; and 2) because agencies tend to work independently, wheels are reinvented parallel' (Britch & Linthicum, 2007).

At the end of 2006 a multi-agency and university working group was brought together by the Animal and Plant Health Inspection Service (APHIS) to confront the issue of RVF. RVF virus is classified as an overlap select agent i.e., affecting both humans and non-human animals, by both the Centers for Disease Control and Prevention (CDC) and APHIS (Britch & Linthicum, 2007). The presentations at this meeting showed that for RVF no effective action plans are in place. It also became clear that knowledge was lacking about RVF transmission and surveillance which could lead to a critical delay in early detection of the agent was it to enter the United States. Another important point was that an effective licensed veterinary vaccine for RVF is lacking and also that there aren't many vaccinated people in the US that can perform diagnostic procedures.

Looking at the high priority that is given to RVF virus by the US government and the gaps in knowledge of RVF by stakeholders, it is inevitable that possible responders in a real outbreak situation should be given the opportunity to learn about the disease and to thoroughly train with their agency to achieve a greater preparedness. Because of the complexity of a vector borne disease as RVF virus, time calls to be very pro-active and to prepare for a type of disease the WNV history has taught us we weren't prepared for. Because of the zoonotic aspect and potential bioterrorist aspect use of RVF, many agencies will be involved in a unified control effort. Agencies with both public health and agricultural backgrounds, amongst others, will have to coordinate and communicate their efforts in order to be able to quickly and effectively respond.

Ecology of Rift Valley fever virus

RVF is an arthropod-borne viral disease with a zoonotic component primarily important in domestic ruminants. The RVF virus also has the capability to infect humans. It is an RNA virus in the genus *Phlebovirus* of the family *Bunyaviridae*. The virus can be characterized by giving a high morbidity and fatalities in both livestock and humans, making it an interesting potential agent to use by terrorists as a biological weapon (Kortepeter & Parker, 1999).

Since it was first reported among livestock by veterinary officers in Kenya in the early 1900s, when an acute and highly disease of lambs was associated with heavy rains accompanied by reports of illness in humans, it has been the source of several outbreaks on the African continent. Since it was first identified in 1931 during an investigation into an epidemic among sheep in the Rift Valley of Kenya, RVF outbreaks have been reported in sub-Saharan and North Africa.

Outbreaks of importance have occurred in Kenya and neighboring countries in 1930-1931, 1968, 1978-79, 1997-98 accompanied by minor outbreaks during the intervening years. The first record of the disease in South Africa was in the 1950s, where RVF virus was not identified until 1951 when humans caught ill performing a necropsy on a bull near Johannesburg (Alexander, 1951). In this severe epidemic sheep were most heavily affected, with around 100 000 deaths and 500 000 abortions reported by the Pretoria Union Department of Health (Shultz, 1951). After various minor outbreaks, a second severe epidemic occurred in South Africa in 1974-76 where again the sheep industry was most severely victim comparable with a 1955 epidemic in Namibia. It was in the 1974-76 outbreak in South Africa when first became clear that humans could die from the disease, in 1975 seven patients died of encephalitis and hemorrhagic fever (Gear, 1977). Other Southern African countries where the disease struck are Zimbabwe (1955, 1957, 1969-70 and 1978), Mozambique in 1969 and Zambia (1973-74, 1978 and 1985). Until 1977, the northernmost country in which RVF was found was Sudan. The first time it extended this Northern border was in 1977-78, when a major epidemic occurred along the Nile delta and valley in Egypt. Many animals and people were victimized by this epidemic, with estimations of 18000 to more than 200 000 human cases and at least 598 human deaths. RVF was first identified in Western Africa in 1987, when epidemics occurred in northern Senegal and southern Mauretania. Again, the human cases were numerous; estimates of 232 human deaths are made (Swanepoel & Coetzer, 2005). In September 2000, the first cases of RVF were reported and identified outside of Africa, namely in Saudi Arabia and subsequently in Yemen. These outbreaks have raised the concern of RVF virus being able to cause outbreaks in for example the Asia, The United States of America and Europe.

The disease is most severe in sheep, goats and cattle but can lead to illness in many species as can be seen in the following table which is derived from a table from Swanepoel & Coetzer, Rift Valley fever, 2005.

Table 1 Susceptibility of vertebrates to Rift Valley fever virus infection

Extremely susceptible (70-100% mortality)	Highly susceptible (20-70% mortality)	Moderately susceptible (less than 10% mortality)	Resistant (inapparent infection)	Refractory (not susceptible)
Lambs Kids Puppies Kittens Mice Hamsters Certain other rodents	Sheep Calves	Cattle Goats African buffalo Asian buffalo S. American monkeys Certain rodents Humans	Camels Equids Pigs Dogs Cats African monkeys Baboons Rabbits Guinea pigs Certain other rodents	Birds Reptiles Amphibians

Transmission

The virus can be transmitted by contact with tissues of infected animals, through aerosols or inoculation of a wound. This mode of transmission is common with certain groups of people who are in close contact with animal tissues like veterinarians, butchers, herders, farmers or slaughterhouse workers (World Health Organization, 2008). The primary route of transmission in animals, and also a possible route in humans, is through an infected mosquito bite. Several mosquito species can be involved in different regions, in Africa RVF virus has been found in 12 species of mosquitoes from the genera *Aedes*, *Culex*, *Anopheles* and *Eretmapodites* (Swanepoel & Coetzer, 2005). *Aedes* mosquitoes are viewed as the primary vectors of RVF virus, but there seem to be a lot of possible secondary vectors, including flies and ticks, which are possibly only involved in mechanical transmission (Kasari, Carr, Lynn, & Weaver, 2008).

The female *Aedes* mosquito is able to transmit the virus vertically, so when its offspring hatches it is already infected. The eggs of *Aedes* can survive in dry areas for several years; this provides the

virus with a reservoir making it more difficult to control and ensuring its survival. These eggs will then hatch when the dry area is flooded, for example after a period with above average rainfall. A suitable habitat for these eggs is provided by the dambo (a low lying temporary wetland) which can be viewed on the following picture, because these areas are subject to periodic flooding and drying.



Scientists study a typical dambo habitat at Sukari farm, a long-term Rift Valley fever study site just outside of Nairobi, Kenya. Picture by Assaf Anyamba.

Because RVF is a mosquito-borne virus, the extrinsic incubation time plays an extremely important part in the disease ecology. This translates into the fact that after the ingestion of a blood meal by a susceptible mosquito, there is a period of one to two weeks before this mosquito can transmit the virus. This feature is often overlooked, although it can be essential in controlling a disease outbreak with limited resources, when looking at for example which animals should be treated in a certain area.

Clinical signs and pathology

Animals

RVF virus can lead to a very specific necrotic hepatitis and hemorrhagic state in livestock, but most of the time the infection manifests itself as mild to inapparent. It leads to high mortality in neonates and abortions at any stage of gestation in pregnant ruminants. Sheep and goats show the most signs. In general, the individual clinical signs are non-specific so it is difficult to get a presumptive diagnosis based upon this. An outbreak will usually be noticed because when in a group of animals suddenly an abortion wave gets noticed and there is an increase of neonatal deaths, accompanied simultaneously by disease in humans.

In new-born lambs and kids the incubation time can be as short as 12 hours, but it usually sets in after 24-36 hours. The mortality in these young animals is 90% or higher, this makes clear what a devastating effect the disease can have on the continuity of a livestock population especially in developing countries. In sheep and goats older than a week the disease can have an inapparent, acute or per acute onset. Mortality is 5-30% and abortion rates are 40-100%. These numbers are based on epidemics in Southern Africa. It is said that abortion and mortality rates in the outbreak in Egypt of 1977-78 were higher (Meegan, 1981). In older animals the incubation time can be up to three days and the animals show signs like fever, anorexia, weakness, listlessness and an increased respiratory rate. The regurgitation of ingesta may show in some animals, as melaena or foetid diarrhea and a blood-tinged, mucopurulent nasal discharge.

In calves the symptoms and incubation time resemble those of lambs and sheep, however they show a higher rate of icterus and the mortality rate during an epidemic is lower; an estimated 20%. In cattle the mortality rate seems to be around 10%, but also was reported to be higher in the Egypt epidemic. Abortion rates in an epidemic are around 15-40%.

Humans

In humans the incubation time is two to six days, after which RVF usually gives inapparent to influenza-like symptoms like fever, nausea, headache, muscle ache and weakness. Although the patients usually recover within two weeks, there are three serious complications. A minority of infected people develop ocular lesions, encephalitis or severe hepatic disease followed by mostly fatal hemorrhagic illness. The ocular disease which is a retinitis can manifest after up to four weeks after the initial illness and it presents as a loss of vision which sometimes is permanent. In the 1974-76 epidemic in South Africa an estimated 20% of the RVF patients the illness was complicated by the ocular lesions. Al-Hazmi and other found it difficult to make an estimation of the percentage of RVF patients with this complication during the outbreak of 2000 in Saudi-Arabia, but reported that 15% was probably an overestimation of the prevalence of RVF-related ocular disease (Ocular complications of Rift Valley fever outbreak in Saudi Arabia, 2005).

The prevalence of the encephalitis or hemorrhagic complication is probably around 1%. The symptoms of encephalitis can start simultaneously with the initial influenza like illness, but can also occur up to four weeks after the initial disease. Signs are for example severe headache, confusion, grinding of teeth and can be as severe as coma and death. It is seen that patients recover completely.

With the hemorrhagic syndrome within two to four days there is the development of petechial rash, purpura, ecchymoses and extensive subcutaneous bleedings from needle puncture sights ultimately leading to cardio respiratory arrest. A portion of the patients with this complication may recover.

Diagnosis

The diagnosis can be made looking at a combination of factors. First of all, a RVF epidemic usually occurs after a period of heavy rainfalls. Besides this, the liver pathology is very specific for RVF. Acute RVF can be diagnosed using serological test such as ELISA which can confirm the presence of specific IgM antibodies to the virus. Also, the virus itself can be isolated from blood during the early phase of infection or in postmortem tissue using different techniques like antigen detection tests and reverse transcriptase polymerase chain reaction (RT-PCR).

Treatment and Control

No specific treatment exists for RVF in humans, although Ribavirin is mentioned as an experimental treatment.

To prevent the disease from spreading or manifesting, there are two types of vaccines available to animals. The first one is a live attenuated vaccine which can be given one time but can lead to abortions and gives a low protection to cattle. Secondly an inactivated vaccine is available, which is not known to give abortions but has to be given twice and is more expensive and thus less available (Coetzer, 2008).

For humans, only an experimental live attenuated vaccine, MP-12, exists which has shown promising results in laboratory trials but needs further research before it can be applied in the field.

Further control measures may consist of restricting or banning the movement of livestock and the implementation of an active surveillance system to be able to recognize an epidemic in an early stage. Vector control has never been applied in African countries but has been a part of control measures in Saudi Arabia. Whether it should be an actively implemented control measure is still a point of discussion (Coetzer, 2008). According to Dr. Kenneth Linthicum, director of the USDA center for Medical, Agricultural and Veterinary Entomology, there are safe ways to treat the soil to prevent Aedes eggs from hatching. A way of doing this is by placing insecticides into the soil (Linthicum, 1999).

Influence of weather

In predicting a RVF outbreak, weather conditions play an important role. RVF virus can survive during dry periods in Aedes eggs which hatch after a period with above average rainfall, so when susceptible animals are near this can lead to an epidemic. Outbreaks in East Africa can be closely related to the heavy rainfall which occurs during the warm phase of the El Niño/Southern Oscillation (ESNO) phenomenon (World Health Organization, 2008) (Swanepoel & Coetzer, Rift Valley fever, 2005).

Why Florida is at risk for a RVF outbreak?

In a recent publication Kasari et al. (2008) analyzed the different pathways in which RVF virus could possibly enter into the United States and affect ruminant livestock, ruminant wildlife and human populations. One of the conclusions in this publication was that Florida is one of fourteen states considered most vulnerable to an exposure of RVF virus. How did the authors come to this conclusion?

In the article, five possible routes were examined for their feasibility: importation of RVF virus infected animals; entry of RVF virus infected people; mechanical transport of RVF virus infected insect vectors; smuggling of live RVF virus and intercontinental wind-borne transport of RVF virus or RVF virus infected insect vectors. All of the pathways, except for the last, the intercontinental windborne transport of RVF virus or RVF virus infected vectors, were concluded to be feasible routes for entry into the US.

When looking at the first of the three plausible pathways, and not considering the smuggling of live RVF virus because for this every state is at risk, Florida seemed vulnerable to exposure. The article doesn't state exactly why Florida is one of the fourteen states, but when looking at its features it becomes understandable how Florida became part of the selection.



Figure 1 Florida seaports (Florida ports council)

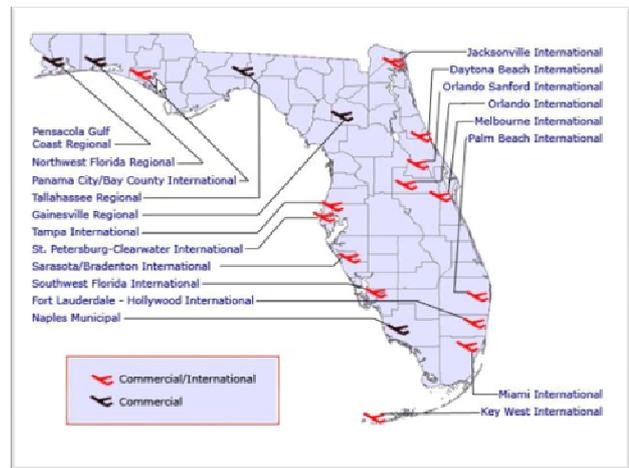


Figure 2 Florida commercial airports (Florida department of transportation)

Florida, nicknamed the Sunshine State, is a peninsula state at the southeastern border of the United States and has a subtropical climate. When looking at Florida in an economic perspective, international trade and tourism are two of the most important means of subsistence. Because of its geographical location, Florida acts as a commercial gateway into continental US, Latin American and Caribbean markets. Florida's many seaports and airports facilitate the great international trade into and outwards from the United States.

As the Trade Stats Express program of the Foreign Trade Division, U.S. Census Bureau, displays, the worldwide international export trade from Florida was worth a total of 44,831,679,000 US dollars in 2007. The African continent is not the biggest importer of trade from Florida, but a substantial amount of trade originating from the Sunshine State ends up in Africa. In 2007 this was worth 655,792,000 US dollars. The import from the African continent to the United States is also substantial; figure 3 shows that in 2007 all merchandise imported from Africa was worth a total of 92,036,025,131 US dollars. In

many cases, Florida then serves as a final destination or a gateway for further transportation into the United States or the Latin American and Caribbean markets.

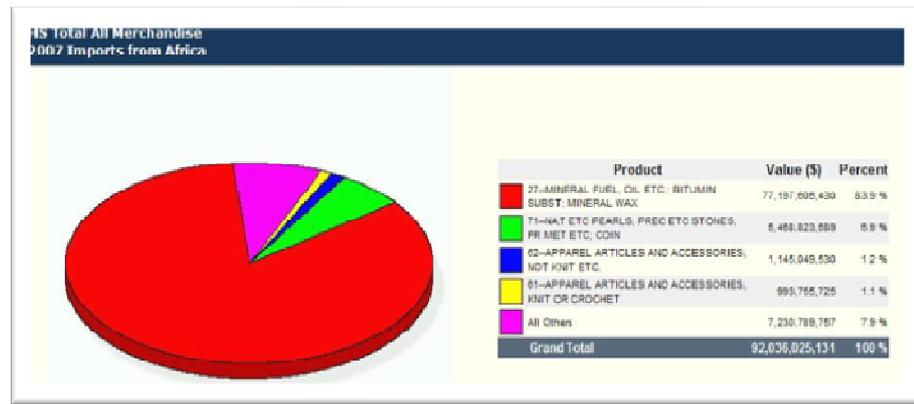


Figure 3 Total all merchandise 2007 imports from Africa

Because of this extensive trade, entrance of RVF virus into Florida through mechanical transport of a RVF virus infected vector can be viewed as a plausible route. In support of this statement, inspecting cargo for insects is not a specific requirement of customs officials neither do clear public health check procedures exist for commercial aircrafts entering the US (Kasari, Carr, Lynn, & Weaver, 2008).

What could also be a possible route is through the importation of a RVF virus infected animal. No so much through legal importation of domestic ruminants, as through the importation of non human primates. Ruminants from RVF endemic countries are difficult to import into the US, not because there is a clear procedure or check on RVF, but because these RVF endemic countries are also endemic for rinderpest or foot-and-mouth disease. Importation of ruminants from these countries is prevented by tight federal regulations. And when these importations do occur, the animals are put into a 30 day quarantine to prevent possible disease to spread. However, the importation of the virus through a non human primate is a possibility. These animals can be legally imported for bona fide scientific, educational or exhibition purposes. These animals do not have to be tested for RVF virus prior to shipment. The Centers for Disease Control and Prevention (CDC) based in Atlanta, has some degree of surveillance for RVF but it is likely that this is not sufficient.

Because Florida has such an extensive network of commercial airports and is an extremely popular tourist destination, entrance of RVF by an infected person is a plausible route. According to the Airports Council International (ACI), both Orlando international airport and Miami international airport rank in the top 30 of the worlds busiest airports. Besides that both airports also rank in the top 15 of busiest airports in North America, only in 2007 they were together responsible for the transportation of a total of 70220832 passengers (arriving + departing passengers + direct transit passengers counted once). The same data sheet shows that Miami international airport ranks fourth on the cargo traffic in North America with a total of 1922985 metric tonnes of cargo transported in 2007 (Airport Traffic Reports). These numbers make introduction through importation of RVF virus infected animals, mechanical transport of RVF virus infected insect vectors or via the smuggling of live RVF virus a plausible route at least not less likely to occur in Florida.

When comparing the above information on international trade and travel in Florida to the possible pathways of entrance of RVF virus as described in the article of Kasari et al. (2008) and mentioned above, it becomes clear that there is a certainly a realistic theoretical possibility of the virus ever entering the US through Florida. If this were to happen, would RVF virus have a theoretical chance to spread within Florida?

To answer this question we must look at the factors necessary for RVF virus to manifest in a geographical area and analyze whether these factors exist in Florida. As discussed in the paragraph dealing with the RVF ecology, one of the essential features of the virus is that it needs an arthropod vector to complete its life cycle. As is well known to Floridians, mosquitoes are certainly not an unknown phenomenon to their state. They have, for example, been the cause of disease in historical outbreaks of Yellow Fever in the state.

Florida is divided into approximately 56 mosquito control districts (Florida Mosquito Control), where active mosquito surveillance and control plans exist and regular mosquito eradication actions are put into action by several involved agencies. Eighty species of mosquitoes are currently identified from collections in Florida (Florida Mosquito Database). These species include the Aedes mosquito which is currently viewed, as mentioned before, as the primary vector for RVF virus transmission.



Aedes aegypti, a possible vector for RVF virus with a state wide distribution (Florida Mosquito Database)

Besides this vector, there also has to be a susceptible vertebrate vector to be able to transmit the virus to. Florida provides in this by having a noteworthy beef cattle industry; the state accommodated approximately 982 404 beef cattle in 2002 (Data and Statistics: Interactive Statistical Map).

Part 2 Exercise Design

Exercise Name:	Blue Mountain Fever Training Exercise, a Tabletop Exercise held for the State of Florida.
Initiative:	Dr Thomas Holt, State Veterinarian of Florida, Director Division of Animal Industry, Florida Department of Agriculture and Consumer Services (FDACS)
Funding source:	FDACS in general, lunches provided by Intervet and Prionics
Liaison at State:	Dr Greg Christy, DVM, Division of Animal Industry
Scenario writing:	Professor Paul Gibbs, Dr Stasia Bembenek-Bailey, Ms Tineke Kramer, Dr Jocelyn Ramey
Organization:	A collaborating effort including between the University of Florida College of Veterinary Medicine, FDACS and the State Emergency Operations Center (SEOC) in Tallahassee
Date:	The exercise itself was two days of length, with a so called 'Hot Wash' session on day three where a discussion and evaluation of the previous two days took place. This in total three day event was held from 18-20 November 2008
Location:	SEOC, Tallahassee Florida
Scenario:	Rift Valley fever outbreak
Type of exercise:	Advanced Tabletop
Focus:	Multi-agency
Accompanying website:	www.flsart.org/rvf

Participating Stakeholders

State:	FDACS	Florida Department of Agriculture and Consumer Services
	FDOH	Florida Department of Health
	FCA	Florida Cattlemen's Association
	FDEM	Florida Division of Emergency Management
	FNG	Florida National Guard
	FWC	Florida Fish and Wildlife Conservation Commission
	FVMA	Florida Veterinary Medical Association
Federal:	DHS	Department of Homeland Security
	FBI	Federal Bureau of Investigation
	HHS/CDC	Health and Human Services/Centers of Disease Control
	SCWDS	Southeastern Cooperative Wildlife Disease Study

	USDA	United States Department of Agriculture
International:	IAH/PL	Institute for Animal Health/Pirbright Laboratory UK

Number of Persons Present

Participants:	87
Expert Panel:	6
Moderators:	4
SEOC Support:	11
Total:	108

Exercise overview

This exercise was initiated to give stakeholders an opportunity to plan, initiate and evaluate their current response concepts and capabilities in a simulated introduction and outbreak of Rift Valley fever in Florida. At the beginning of the exercise, it was made clear to the participants what their tasks for the coming days were, first of all to detect, control and eradicate an introduction of RVF virus into Florida and second of all to speculate how the virus might have entered into the USA. Looking at the exercise in a broader perspective several goals were set for the participants, one of them was to learn about the biological complexity of Rift Valley fever virus. The exercise planning time put up a website prior to the exercise with several sources of information participants were advised to review before arriving at the SEOC. The materials on the website would give them a basic idea of the ecology of Rift Valley fever. Also, during the exercise a so called Expert Panel was available for questions when knowledge concerning the disease was lacking. This Expert Panel consisted of world wide renowned experts on subject matter issues and they also played a part in the evaluation part as they observed the participants during the exercise.

An important feature of the exercise was that so many different agencies were in attendance. To the knowledge of the exercise planning team, this was the first time ever a Rift Valley fever outbreak was exercised on the State level with such a broad agency presence. By having all these agencies responding to the events from one location, yet providing them with their own rooms, the aim was to keep the situation as realistic as possible but to give individual stakeholders a chance to interact and collaborate more easily in their actions and responses with others.

This exercise could not have taken place without it being a collaborative effort between FDACS, the University of Florida College of Veterinary Medicine and the SEOC. This unique approach was the key to a successful three day event.

Key learning goals of the exercise

- The exercise gave an opportunity to learn about the biological complexity of Rift Valley fever
- It gave an opportunity to learn about response when a bioterrorist event is suspected
- Key state regulatory/emergency response agencies were brought together, so they could evaluate the coordination and critical decisions made as the local, state and federal government response resources were integrated.
- Stakeholders could explore issues surrounding current diagnostic and response capabilities to Rift Valley fever available in the United States.

- Stakeholders could explore issues surrounding multi-agency crisis communication efforts involving a vector-borne zoonotic disease incident
- Stakeholders could acquire an increased awareness of disease response issues associated with a vector-borne disease versus a disease spread by direct contact

With the motivation to make the table top exercise as realistic and challenging as possible and to stimulate a creative response, a variety of tools were applied enlisted under 'key features'. By applying these factors, the exercise planning team hoped to give the participants a feel of the 'real thing' and to prevent them from becoming reactive instead of pro-active. When a real outbreak occurs, time is most certainly of the essence; therefore this was considered an important feature of this educative training exercise.

Key Features of the exercise

1. Large scale multi-agency exercise with over 100 participants November 18 - 20, 2008
2. Real-time character for 1½ days of 2-day scenario followed by ½ day of an accelerated time-frame covering the following 3 weeks.
3. Day 3 of the exercise was for review and critique
4. Use of actual weather conditions
5. Use of actors in the field who could be reached for information about the scenario
6. Use of video in situation updates, including mock news reports
7. Availability of support functions for participants, including: GIS, meteorology, technical support
8. Use of website for exercise preparation
9. An appointed rapporteur from each focus group recorded the activities of the group and uploaded the report onto the SEOC network

Exercise event synopsis

Pre exercise activities

In preparing for the exercise, a substantial amount of organization and planning took place. Most of this work was done by a four headed exercise planning team, assisted by the state liaison at FDACS and support team at the SEOC in Tallahassee. The work started approximately six months prior to the exercise, in June of 2008, and became more intense as 18 November came closer. The first phase of preparation consisted of thinking up a format for the exercise. A key feature of this exercise was the use of real locations and real people as actors in the scenario. To make this format to a success, these locations and people needed to be contacted and visited. Because this was such an important feature of the whole exercise, it was of the essence that the involved actors and locations were very cooperative. To achieve this, many contact moments took place and many conference calls were made.

When it became clear which locations and actors were going to be incorporated into the scenario, the second phase of the preparation started: the detailed thinking out and writing of the scenario. This phase was accompanied by the editing of the many videos material made during the visits to the locations and actors. Quotes needed to be cut to be able to fit into the scenario and a professional editing group at IFAS (Institute of Food and Agricultural Sciences) was contacted to assist with the montage of the real looking, but mock news reports.

The last phase of preparation consisted roughly of the translation of the scenario into power point presentations and the writing of questions for each breakout session. In this phase the workbook was also compiled.

Scenario as presented to participants

On November 13th, calves begin to die at Buck Island Ranch in Lake Placid, FL. As part of an ongoing calf-loss study in association with Auburn University, a research assistant at the Ranch notes the calf deaths and performs standard necropsies on the calves. Over the ensuing few days, the research assistant notes an increase in dead calves and a few apparent abortions that are above baseline. After consultation with the Ranch veterinarian, Dr. Yelvington, and Dr. Roberts at Auburn University, 2 dead calves along with tissue samples are taken to the Kissimmee Diagnostic Laboratory on November 14th. Later that evening, Dr. Tom Holt, Florida State Veterinarian, receives a telephone call from Dr. Agasan, Chief, Bureau of Diagnostic Laboratories Division of Animal Industry of DOACS in Kissimmee, FL. Dr. Agasan reports liver lesions in the calves for which Rift Valley fever (RVF) is considered a rule out. Dr. Holt recommends a histopathological work-up through the weekend.

On November 17th, Dr. Agasan contacts Dr. Holt with histopathology findings. Dr. Holt, based on the extent of clinical disease, strong supporting necropsy findings and a threat letter regarding bioterrorism that was received that day, decides to quarantine the farm and convene the DOACS response team. Samples are submitted to Plum Island for RVF confirmation.

On November 18th, there are continued calf deaths and abortions occurring at Buck Island Ranch. DOACS investigators at the Ranch note transport of meat goats from a ranch in North Florida to Buck Island on October 27th. Upon further investigation, it appears that a research scientist, Tim Conway, on Buck Island Ranch purchased these goats and then sold 5 of the 15 goats that were purchased to Brighton Seminole Indian Reservation on November 2nd. CDC confirms the diagnosis of RVF in the samples submitted from Kissimmee Diagnostic Laboratory.

There is a growing concern for potential human cases. Some cowboys and the research scientist at Buck Island have mild to moderate flu-like symptoms. An ophthalmologist in Gainesville, FL is aware of newspaper reports of potential RVF and contacts the state health department regarding Katie Wiseman, a patient with retinitis. He requests assistance in ruling out RVF. There is also an outbreak of seasonal influenza in West Palm Beach, FL along with a case of hemorrhagic fever for which the Palm Beach County health department is requesting a diagnosis of RVF from the CDC.

On November 19th, the 8-year-old boy diagnosed with hemorrhagic fever dies in West Palm Beach. It is reported that the boy, along with his father, slaughtered a goat purchased from the Brighton Seminole Indian Reservation through the Okeechobee Livestock Market. The CDC reports that the boy's and the father's blood samples are positive for RVF.

On November 21st, calf deaths and abortions at Buck Island Ranch dramatically decrease. Mosquito surveillance detects a wide range of possible vectors at Buck Island, including a species native to Africa. The events occurring through December 8th include: no further cases of RVF or any serologically positive animals are detected in Palm Beach County, no serologically positive animals or people are detected in Hawthorne, FL, no serologically positive animals are detected in Gainesville, FL and no wildlife species are found positive for RVF.

The scenario concludes with connection of events to determine that the outbreak of RVF was a bioterrorist event originating at Buck Island Ranch. Katie Wiseman, the patient with retinitis in Gainesville, was part of the bioterrorist team and accidentally infected herself with RVF on October 17th at Buck Island Ranch. Tim Conway, researcher at Buck Island Ranch, is central to the bioterrorist plot and is unable to be found.

The scenario was designed to lead to a successful confinement and elimination of active RVF cases. However, the potential of the virus surviving in mosquitoes is left as a possibility. The need for continued surveillance was emphasized.

Exercise overview

The first two days of the exercise consisted of the true outbreak, followed by a so called Hot Wash session or evaluation on day three. During the exercise, the format applied to communicate information to the participants was by using power point presentations with integrated video. Dr Paul Gibbs, head of the exercise planning time, gave these presentations. In the first presentation important matters like the structure and rules of the exercise were highlighted.

The following presentations consisted of so called Situation Reports, a total of six were communicated to the participants. During these reports, the situation at that time was being displayed. People received information on how many animals had died, about any new cases and so on. The power points had video material from actors in the field and fake news reports incorporated. Each Situation Report was followed up with an instruction and questions from the Incident Command, a breakout session and a reporting back session to the Incident Command. This sequence is displayed in the following snap shot from the program.

	9:30 - 10:00	Situation Report 1
	10:00 - 10:15	Instruction from Incident Command (IC) & questions
	10:15 - 11:00	Break Out Session 1 (with coffee)
	11:00 - 11:30	Reports & Recommendations to IC
		Response from IC
	11:30 - 12:00	Situation Report 2
	12:00 - 12:15	Instruction from Incident Command (IC) & questions
	12:15 - 2:00	Break Out Session 2 (box lunches)
	2:00 - 2:45	Reports & Recommendations to IC
		Response from IC

Fig 4 Snapshot from the program to display sequence of events

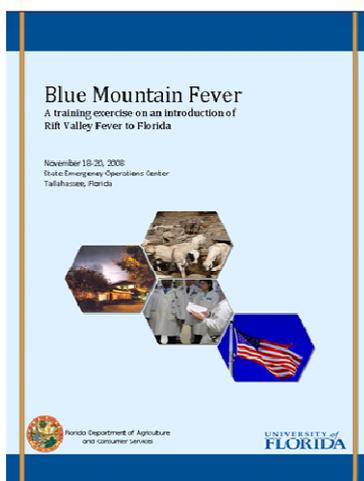
Following each Situation Report, the time for reporting back to the Incident Command, the so called breakout time, was different. Again to underline that time is of the essence and that this exercise was meant to be a realistic simulation of an outbreak event.

The different agencies were divided into an Incident Command group and a total of five Focus Groups. A list of all participants can be viewed in appendix x. The names of the groups reflect issues which would most certainly be addressed in a real life RVF outbreak. During other multi-agency exercises, dealing with a bioterrorist Avian Influenza and small scale RVF outbreak, a similar approach applied (Jackson, et al., 2006) (Agroterrorism Program After Action Report, 2005) According to each persons focus in a real life setting they were placed in a group. Figure x displays the different Focus Groups and their names:

Incident Command	
Focus Group A	Animal Health
Focus Group B	Human Health
Focus Group C	Quarantines, Law Enforcement and Legal
Focus Group D	Entomology, Mosquito Control, Meteorology and Modeling
Focus Group E	Crisis Communications and Public Relations

Fig 5 Focus groups and their functions

The groups were appointed both a section in the big central space of the SEOC and a separate so called breakout room to which they each could retreat and discuss their actions and responses during the breakout sessions. These breakout rooms surrounded the central room and were located close to each other. This distribution of groups made interaction between rooms simple but yet reflected the isolation of agencies geographically during real-life events. The central room was used for the six Situation Reports presentations.



Cover of the workbook as handed to all participants

Each group was appointed a facilitator and was asked to appoint a rapporteur. The facilitator was viewed as the central person in a group, as the person who would likely lead the discussions and as the one reporting back to the IC after each break out session. Each break out room was equipped with one computer with all the necessary files for reporting back, and with multiple computers with internet access. An appointed rapporteur was responsible for logging activity and reporting during a break out session. The exercise planning team set up a suggested reporting format, consisting of a power point file with template sheets with four reporting panels headed by: critical issues, information gathered action options and recommendations.

Each participant was handed a workbook at the beginning of the exercise, which included handouts of each of the six Situation Reports and a series of questions drawn up per group for each break out session. These questions were formulated simply to stimulate discussion and to supplement direction to the Incident Command group and were not meant to be specifically addressed when reporting back. At the beginning of the exercise, all six Situation Report sections of the workbook were separately sealed. Participants were asked not to break these seals until each subsequent Situation Report had been presented. The power point handouts were also available on multiple computers per Focus Group.

The first 1.5 days the exercise played in real time, so that weather data for October and November 2008 applied. On the last half of the second day, time accelerated onwards to 8 December.

Whilst the exercise was mainly a table top exercise, contact telephone numbers of key characters in the scenario were provided to the participants both in the Situation Updates as in the workbook. These actors provided participants with trace out information critical for the control of outbreaks.

Hot Wash

During the morning of day three of the exercise, a so called hot wash took place. This evaluation morning consisted of a discussion of the timeline and events with the scenario writers in which participants could give their opinions about the previous two days. This discussion was followed by a live video conference in the central area with Dr Koos Coetzer, a world wide renowned RVF expert of the University of Pretoria, who was available for questions from the participants about the disease and its control in its endemic areas. The hot wash was then completed by a review by the Expert Panel which presented its observations and was inviting participants to discuss these with them.

Part 3 Exercise Evaluation and Conclusions

Exercise objectives

Accompanying the exercise goal and report hypotheses mentioned in the introduction, a list of seven objectives has been formulated. These objectives reflect the criteria which determine whether or not the exercise was successful. Therefore, and these objectives were used in composing the evaluation forms for both the Expert Panel as the participants.

As mentioned earlier, these objectives can also be viewed as research questions, because if these five objectives would be seen as accomplished by the end of the evaluation, the H0 of the report can be accepted.

1. Give the participants an opportunity to learn about response actions when a bioterrorist event is suspected,
2. Give participants an opportunity to learn about the biological complexity of Rift Valley fever,
3. Have participants explore issues surrounding current diagnostic and response capabilities to Rift Valley fever currently available in the United States,
4. Have participants explore issues surrounding multi-agency crisis communication efforts involving a vector-borne zoonotic disease incident,
5. Have participants acquire an increased awareness of disease response issues associated with a vector-borne disease.
6. Review the strengths and weaknesses of the exercise as brought forth by the expert reviewers and participants,
7. Identify potential areas for improvement for future exercises and actions in case of an actual outbreak of Rift Valley fever.

Used methods

The exercise evaluation used three separate mechanisms:

1. Observations made by the Expert Panel.
Each of the six members of this panel was appointed to one main Focus group or Incident Command group to observe. The members were handed an evaluation form at the beginning of the exercise to use as a tool to document their observations.
On day three of the exercise, the Expert Panel presented their findings to all participants after which a group discussion took place.
2. Hot wash session on day three of the exercise.
3. Filled out participants evaluation forms.
A few days after the exercise took place, an evaluation form was sent out to all

participants to give them the opportunity to inform the exercise planning team about their impression of the event.

The findings from each of these evaluation mechanisms will be discussed separately in the next section in order to accept or deny the hypotheses.

Expert Panel Observations

As mentioned above, each member of the Expert Panel was appointed one main group to observe. This was communicated to them prior to the exercise. It meant they should focus on this group in their evaluation, but that they were of course allowed to also observe other groups when thought necessary. Besides observing the responses of individuals within the Focus Groups, the Expert Panel was also asked to assess the realism of the exercise and the interagency effectiveness of the Focus Groups as experienced by the Focus Groups.

The six group members were distributed over the participants through consideration of their own specializations in real life as displayed in the following figure. By doing this, the exercise planning team aimed at getting the most valuable information back from their observations. The form assisting the panel in their observations can be found in appendix C.

Incident Command group	Professor Peter P.C. Mertens, Head of Arbovirus Research, Division of Epidemiology, Institute for Animal Health, Pirbright
Focus Group A – Animal Health	Dr. Thomas G. Ksiazek, D.V.M., PhD, formerly chief of the special pathogens branch at the Centre for Disease Control
Focus Group B – Human Health	Jocelyn Mullens, D.V.M., MPH student
Focus Group C - Quarantines, Law Enforcement and Legal	Steven Goldsmith, D.V.M., microbiologist, FBI, U.S. military veterinarian
Focus Group D - Entomology, Mosquito Control, Meteorology and Modeling	Kenneth J. Linthicum, Director of the Center for Medical, Agricultural & Veterinary Entomology
Focus Group E – Crisis Communication and Public Relations	Gregory S. Christy, D.V.M. Division of Animal Industry, FDACS

Fig 6 Expert Panel members and appointed group

Expert Panel observations, interpretations and conclusions

The Expert Panel was handed a form assist to in their observations, this form consisted of a questionnaire with ten questions, room for comments and a problem log to report issues arising during breakout sessions. To assist in the answering of the posed research questions, an analysis of the questionnaire is at first interesting. Questionnaire results

In the questionnaire answers, the five-level quality Likert scale was applied, a scale often used in surveys and evaluations. The scale was used as followed:

- 5 = Excellent
- 4 = Above Average
- 3 = Average
- 2 = Below Average
- 1 = Extremely Poor

To be able to analyze the responses to the questionnaire, excel was used enter the data and to insert this into a so called spider diagram.

The following spider diagram is a summary of all mean question answers given about all six groups (Incident Command and Focus Group A – E). The numbers surrounding the web reflect the accompanying question; the axis of the web reflects how that specific question was scored. For example question number three received an average score of 4.

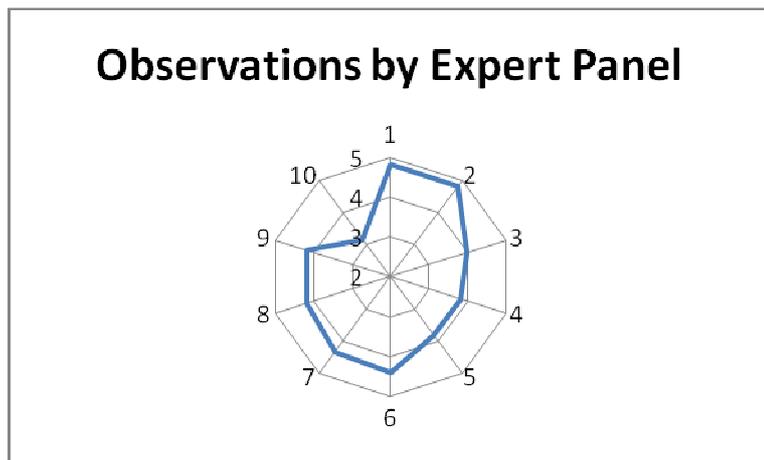


Fig 7 Expert Panel questionnaire scores

What strikes is that overall question one and two were answered as excellent by most Expert Panel members. The exact average score was 4.83 out of 5 for both questions. When looking at the six separate filled out questionnaires, every observer scored the questions as either 4 (= Above Average) or 5 (= Excellent). As can be reviewed in appendix C, these questions were about whether the group was sufficiently challenged by the scenario and if the events presented were viewed as realistic by the observed group. By analyzing these results, it can be concluded that the Expert Panel had the impression that the observed groups experienced the scenario as very challenging and realistic.

Comments made by the Expert Panel in support of this analysis:

- *‘The group was more than adequately challenged by the scenario’*
- *‘Recognized events as very serious challenge & potential for heavy Law Enforcement response – State, Federal’*
- *‘Events were considered realistic based on previous disease requirements – Brucellosis, TB, PRV etc in feral swine’*
- *‘Initially the scenario did not particularly challenge this Focus Group. The initial response followed the normal lines of response to something like West Nile Virus detection. However, as the situation developed and the significance of RVF detection and the potential for an RVF outbreak became clear the Focus Group became more*

challenged. The Focus Group quickly responded by enhancing surveillance and control efforts significantly beyond normal response efforts.'

- *'The events were perceived as realistic by the group, although the events were complicated and not easily understood during the exercise and were not clear until the final Situation Report.'*

Though question one and two were answered as overall very positive, question ten received less applauding scores. This question asked whether communication with other Focus Groups was effective. The exact average score here was 3.17, which is well below the highest score of 5. Separate Expert Panel member answers varied between 2 and 4. The highest score of 5 was never appointed to this question and 3 was the most given score. This implies that most observers had assessed the effectiveness of communication with other Focus Groups or Incident Command as average. In the observation of Focus Group E, Crisis Communications and Public Relations, question ten was scored with the lowest score of 2, which is well below the average of 3.17. Communication with other Focus Groups and Incident Command was an essential component of this exercise; the rapid and effective control of an outbreak of a disease with a zoonotic component in large part depends on the quality of a unified response. An adequate response can only be accomplished when the involved stakeholders work together, and without good communication this can not exist. Therefore this score should be taken into account in our recommendations.

Comments made about the response to question ten:

Incident Command

- *'Communication with other groups started slowly but improved. The Command Group needs dedicated communication support both outwards and inwards.'*

Focus Group A – Animal Health

- *'Early scenario communication with other focus groups not optimal.'*

Focus Group B – Human Health

- *'The group was slow to recognize that they could telephone the 'actors' and utilize computer resources as well as the resources of other groups.'*
- *'On Wednesday the group organized more effectively. Some members began to work on a timeline and others on a line listing, while others 'travelled' to other groups to coordinate about interviews and gather information.'*

Focus Group C – Quarantines, Law Enforcement and Legal

- *'Had little or no contact with some Focus Groups (Entomology etc). Generally had contact with IC (Incident Command), Animal Health Group.'*

Focus Group D – Entomology, Mosquito Control, Meteorology and Modeling

- *'Improved communication between Focus Groups would be desirable.'*

Focus Group E – Crisis Communications and Public Relations

- *'The Focus Group was not fully aware of the response resources available because of poor communication between the focus groups. This problem was partially due to the time compressed nature of the exercise but also due to the reluctance of Focus Group members to venture between the Focus Groups.'*

What can be noticed from some of the comments is that communication with other Focus Groups started out slowly on day one, but that it improved as the exercise proceeded. What can be concluded from this observation is that participants needed some time before taking the initiative to venture between groups for information sharing. Several causes for this initial reluctance can be thought of;

- Participants needed some time to get used to the whole setting of the exercise;
- Participants were overwhelmed by the amount of information received at the beginning of the exercise, and needed some time to process this within their own group;
- Groups were not aware of what other groups were undertaking so that they consequently were not aware of the mutual benefits good contact between groups can offer in a zoonotic disease outbreak;
- A good task distribution within a group was lacking so nobody felt responsible to go over to another group for information sharing.

These causes or factors which influence good communication between stakeholders are displayed in the following figure. When each of the outer ring factors are clear to all participants in an exercise, this will contribute to and facilitate good communication between the different groups.

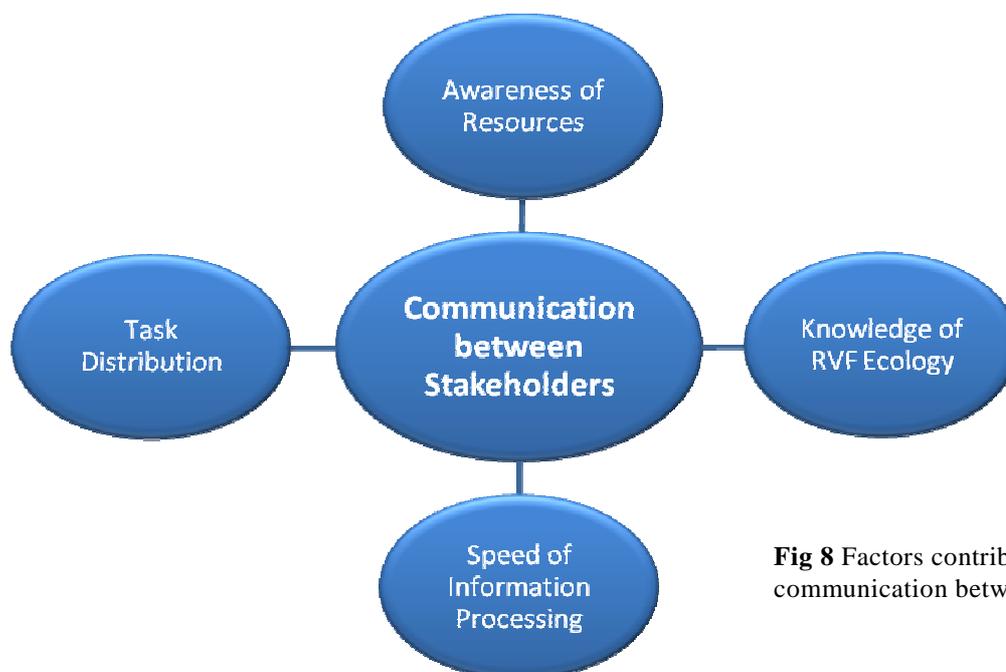


Fig 8 Factors contributing to good communication between stakeholders

We can analyze several of these factors because, for example, when considering whether groups were overwhelmed by the scenario, we can look at question number one which, as discussed earlier, dealt with if the scenario was sufficiently challenging to the group. Question five is also relevant in this context, as it asks about if the members of a group had a basic knowledge level of the biology of RVF virus. A very positive score for question one combined with a less positive score to question five would support the statement that groups were overwhelmed by the scenario. As discussed earlier, question number one received a very positive score, namely 4.83 out of 5. Several earlier mentioned comments about this question ('The group was more than adequately challenged by the scenario' and 'The events were perceived as realistic by the Group, although the events were complicated and not easily understood during the exercise and were not clear until the final Situation Report.') support the statement that some groups were overwhelmed by the scenario and might have needed some more time to process the information within their own group. When looking at the spider diagram, question number five received a mean score of 3.83 out of 5, this is overall the second lowest scored question out of a total of ten questions. Separate groups scores ranged from 3 to 5, with the highest score being appointed only once: to the Incident Command group. These results identify that at least some groups were not sufficiently educated about the complex biology of RVF virus prior to and during the exercise, although they had a website available to them to prepare and subject matter experts in attendance at the exercise.

An early introvert response is very humane and understandable, but it must be appreciated that in a real life zoonotic disease outbreak the amount of information, especially at the onset of an outbreak, can also be very imposing. In such situations it is of the essence to be able to process material very rapidly and to incorporate all available information for a correct overview of the situation. This can not be done without excellent communication between groups with other and overlapping expertise. Through this contact, tasks can be delegated to the right stakeholders to prevent redundancy in response and to maximize the quality of the unified response. When a knowledge gap exists at the onset of a disease outbreak, responding correctly is a lot more difficult and time consuming. All stakeholders therefore need to have a basic knowledge of RVF ecology.

Question three and four asked about if the group was aware of the resources available and if these resources were used appropriately. Next to applying the offered mapping and presentation resources, utilizing of the other groups 'know how' was also part of the total available resources. When looking at the spider diagram for the average scores to these two questions, number three was scored as 4 and number four received a score of 3.83 out of 5. A big variation exists between the separate group scores to these two questions. Half of the groups scored above average to excellent whilst the other half's scores did not exceed average on both question three and four. These results are in support of the statement made earlier, that half of the groups were not aware of what other groups were undertaking so that they consequently were not aware of the mutual benefits good contact between groups can offer in a zoonotic disease outbreak.

Question number nine asked about the clearness of task distribution within the group. As can be reviewed in figure 7, the spider diagram, question nine received an average score of 4.17 out of 5. This is overall a relative above average score. When looking in the separate

groups, the scores of this question range from 3 to 5. These results make it likely that the factor of task distribution, at least for the groups which received an average score, contributed to slow communication between groups.

When taking into account that the communication with other focus groups improved as the exercise proceeded, it can be concluded that the above stated causes for gaps in communication were also less problematic than as at the beginning of the exercise. Participants must have gotten used to the setting of the exercise, they most likely learned to process the information in a more efficient way, the groups got more aware of what other groups were undertaking and of the value of good communication between groups and lastly task distribution took on a more organized shape. We will see if we can find more support for these conclusions in the following discussion of the participant's questionnaire.

Participant's questionnaire results, interpretation and conclusions

Shortly after the exercise, an evaluation questionnaire was sent out to all 87 participants asking the players to check their level of agreement about a total of 50 posed statements with room for comments. As can be reviewed in appendix D, this questionnaire applied the five-level Likert scale with the following possible scores.

- 5 = Strongly agree
- 4 = Agree
- 3 = Neither agree nor disagree
- 2 = Disagree
- 1 = Strongly disagree

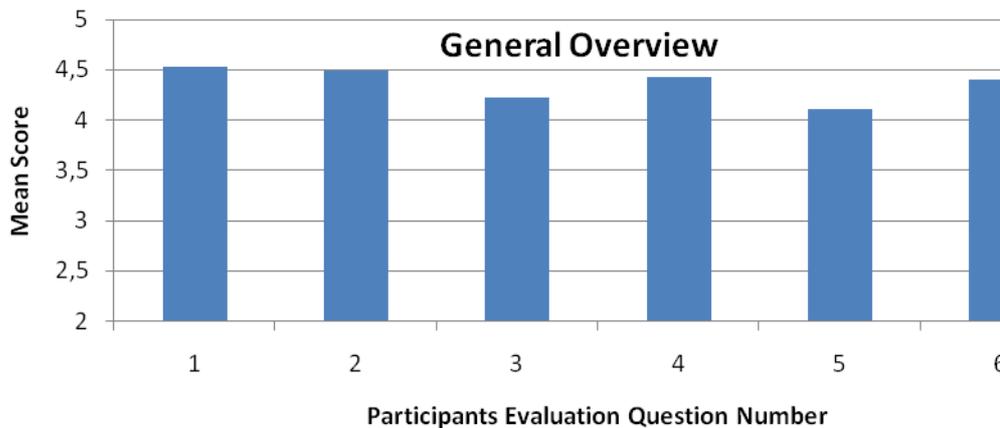
A total of 36 questionnaires out of a total of 87 were filled out and sent back, which equals a return percentage of 41.38%. The questions were headed by five exercise related subjects, so that the exercise planning team could get a broad impression of how the exercise was experienced by the participants. Next the results of each section separately will be discussed. The five mentioned subjects consisted of:

1. General overview of the exercise
2. The Scenario and Presentation
3. The Organization of the Exercise
4. Knowledge and Communication
5. The State Emergency Operations Center (SEOC)

To be able to analyze the data from the filled out questionnaires, again excel was utilized. First all the data was entered into tables, after which the mean score per question was calculated. These means were then entered into a chart to display whether or not there were striking scores, which will then be interpreted and discussed with or without supporting comments found in questionnaires.

General overview of the exercise

The following chart displays the mean scores of every question in the first section of the questionnaire.



This section of the questionnaire consisted of six questions asking about agreements with statements about participant's general impression of the exercise. What strikes first of all, is that the overall impression of the exercise was very positive, scores ranging between 4.11 and 4.52 out of 5. Question one and two were scored highest, those consisted of the following statements:

1. Overall, the exercise was educational and well organized
2. The exercise raised my awareness of the threat of RVF to Florida

In further support of question one, question four also received high agreement. This statement was about if participants felt they were educated on the issues surrounding the control of a vector borne zoonotic disease.

Comments in support of the scores to these questions:

- *'This was a fantastic effort and remarkable how smoothly the planners and facilitators made this complex exercise work! Enjoyable and educational both. Wonderful to have national and international leaders in RVF participating and available for questions!'*
- *'This is the 1st time that I have assisted with and participated in an exercise that was so well put together and I greatly appreciate the opportunity.'*
- *'The exercise was very well organized and managed and time management was very effective.'*
- *'Very well thought out and conducted. Use of videos, maps, and real places and people made it seem plausible and hit close to home.'*
- *'I have participated in many table top exercises and found this one to be one of the best I have ever participated in. I feel the program was designed to maintain the interest of the participant and not just a work book exercise.'*
- *'Excellent!! This exercise was well planned and thought out. Incorporation of video discussion with field experts dealing with RVF in real life provided an invaluable training tool for the exercise participants.'*
- *'I have participated in only 2 really excellent emergency response exercises in my 29 year career. This was one of them. I think others in my agency could benefit from participation in this exercise. Perhaps it could be run again in a different state and*

more APHIS, VS personnel invited? This is the only exercise scenario I have participated in that involved a vectored foreign animal disease which was also a public health hazard. The interaction of animal health officials with mosquito control officials and public health officials was enlightening. The timeline in this exercise (usually a weakness that contributes to an unrealistic atmosphere) was reasonable and practical.'

Questions three and five were about if participation in this exercise made both the participants itself and its accompanying agency better prepared to respond to a vector borne zoonotic disease incident in Florida. Although the scores to these questions were still high namely 4.23 and 4.11 respectively, some comments were made about the subject:

- *'This exercise brought out many areas within our response methods that must be improved before we respond to a disease outbreak such as this.'*
- *'While I think that overall this was an excellent exercise; I feel more work need to be done to actually garner an adequate response.'*
- *'This exercise enabled us to better assess capacity and capability to perform our functions in such a situation.'*
- *'Overall, I felt that the exercise was very well presented and organized. Now, I feel that I would be better able to participate in a real life event now that I have been through this training.'*

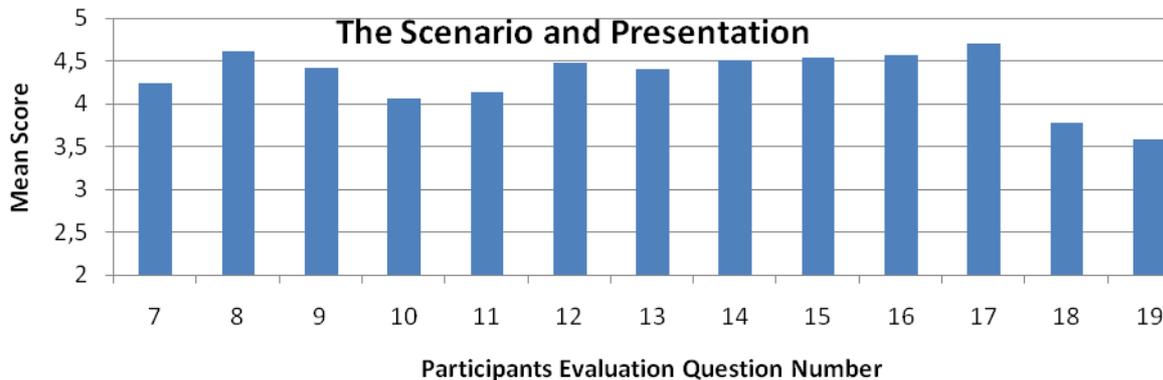
What can be concluded from these comments is that the exercise assisted in better preparation, and that it brought out many response areas that need improvement, but that more efforts still have to take place to reach an appropriate level of preparedness with every person and agency. This is not an unexpected conclusion, this exercise being the first dealing with an unknown vector borne zoonotic disease on a Florida state scale.

Finally, question six dealt with the live video conference with Dr Coetzer as held during the hot wash session on day three. The comments about this opportunity to ask remaining questions about RVF to a world wide renowned expert on the disease were overall positive, but some people would have liked some more time:

- *'Additional time to discuss RVF with Dr. Koos Coetzer would have been beneficial.'*
- *'I think that having Dr. Coetzer talk to us about RVF was a great touch. In some ways, presenting a scenario like this RVF exercise may not be as real to someone like me that is new to working in a government agency. Dr. Coetzer was able to put the gravity of an introduction of RVF to the US into perspective.'*
- *'The video conference with dr. Coetzer was exceptional. I feel that the overall exercise was beneficial to many new participants in the evolution of preparedness in Florida.'*

The Scenario and Presentation

The following chart displays the mean scores to every question in section two about specifically how the scenario was experienced and whether the approach to communicating information to the participants was effective and appreciated.



Striking high scores in this figure are question eight, twelve and fourteen to seventeen. What can be concluded from the high amount of agreement to these statements is that the use of real locations increased the motivation to engage in the scenario and that the 'real time' nature of the first 30 hours of the exercise were also engaging as this more closely reflected the reality of an outbreak. Participants appreciated the use of real actors in the scenario in that this brought greater realism to the exercise. In the communication of information about the current situations the use of power point and embedded video was experienced more effective than a paper narrative. Finally participants appreciated the workbook handed to them at the beginning of the exercise, in that it was easy to use and that it provided easy access to hand out copies of the power point presentations for them to review.

Comments in support of these statements:

- *'The scenario was very well organized. Great job! Best exercise I have been a part of.'*
- *'I liked the concept of real time roll play in this event, and the fact that interaction between the actors, and the groups, was necessary for the event to progress. I believe that it brought to light to a couple of the groups the need to work together, share information, and be able to give clear direction on their needs.'*

Other comments also expressed some critiques:

- *'There was an expectation for exercise participants to interact with exercise "actors" and group facilitators in order to garner information to further facilitate the exercise. Early on in the exercise there seemed to be some confusion on the part of the exercise participants regarding this expectation. This interaction did, however, improve as the exercise progressed.'*
- *'It may be beneficial to more clearly define all roles for the exercise and the expectations of the exercise participants (for this interaction) when initially setting the stage for the exercise. Provide additional time for breakout sessions would also be beneficial to allow participants sufficient time to make necessary contacts and work through the scenarios.'*

- *'The actors or should I say the "real" people were a refreshing aspect of the drill. I believe that it took a while for the players to realize that this was for real as far as contacting those folks in play.'*
- *'Outstanding scenario and presentation. We did struggle with time constraints for intergroup communications and feedback.'*

These comments show that there was some initial uncertainty about what exactly was expected from participants. This should be taken into account in the planning of future exercises dealing with the same type of scenario and approach. Also, it is mentioned that some participants experienced there being too little time for intergroup communications and feedback. As the exercise was in real-time for the first 1.5 days, this problem might be an issue for improvement when looking at inter-agency communication. In a real-life disease outbreak event, time cannot be set still to have more time to communicate and receive feedback. Often, a disease has even spread more heavily before the first cases are detected, this reflecting that control is already behind in time. An efficient system of inter-agency communication should therefore be developed.

Relatively low scores were appointed to question ten and eleven, and eighteen and nineteen. To begin with the first two, one comment is in support of a somewhat lower score to these questions dealing with whether the scenario provided an appropriate challenge and number of injects to the participant.

Focus Group A, wildlife group:

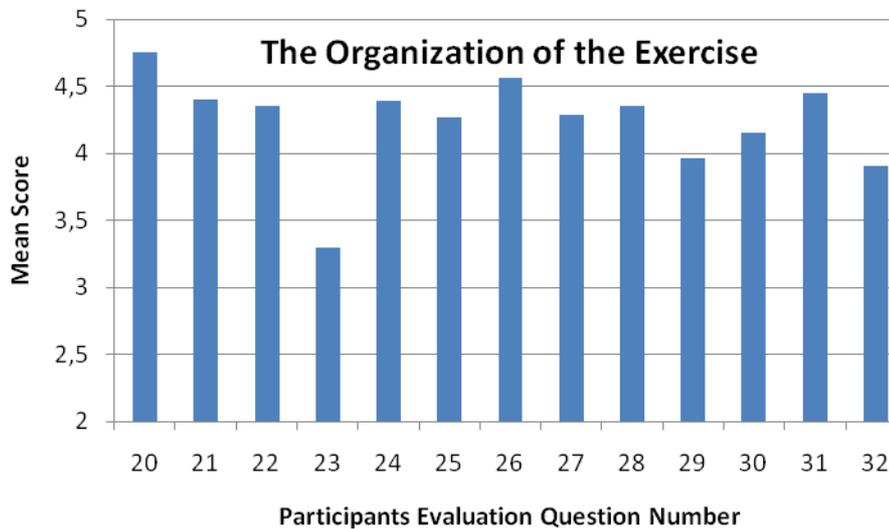
- *'Although the scenario was plausible, there were limited opportunities for me to provide input related to my expertise. There were a couple references to areas that were relevant to AC (petting zoo and research animals) but they could not be pursued because of the limits imposed on the exercise.'*

From this comment it can be concluded that some participants felt more injects could have been worked out for their specific field of expertise. In future exercises of this scale, it must be emphasized that a sufficient amount of injects for all involved stakeholders should be incorporated into the scenario and should be developed into a certain amount of depth. This being an elaborate task, it may require a more extensive exercise planning team as was applied in the preparations for this exercise.

Finally question eighteen and nineteen asked whether the available powerpoint files put onto the computers were accessed used as a resource. According to the scores some people did and some did not use these files. This can be taken into account in future exercises.

The Organization of the Exercise

The following chart reflects the mean scores in the third section of the participant's questionnaire. This section consisted of statements about whether the organization of the exercise came across as well planned and if it was a workable format.



The highest score of all fifty mean questionnaire scores was appointed to question number twenty, which stated that the exercise planning team came across as professional and well prepared. A score of 4.75 undoubtedly reflects that participants strongly agreed with this statement. This must be viewed as a very positive outcome, because if this score would have been negative it could have been the cause of many other issues. When the actual planners of an exercise do not come across as professional and well prepared, how is it possible for the participants to keep motivated and engaged in the scenario?

The low score in this cluster is appointed to question number twenty-three, which is a statement about if the used structure of an Incident Command and Focus Groups allowed for faster inter agency communication. This question was scored with a mean of 3.29 out of 5, with not a big variation in answers given by individual participants. This score can be interpreted as that participants did not have a really positively experience this format; neither did they have a real negative association with it. This is still quite difficult to draw a conclusion from; maybe comments made by participants can clarify as to why people did not appreciate this approach to the fullest, as it did reflect the isolation of agencies geographically during real-life events.

- *'It did not appear that the ICS structure was being utilized at the onset of the exercise. Had the ICS structure been implemented immediately, I believe the Incident Command unit would have been more successful in fostering communication between its members as well as the focus groups.'*
- *'The Incident Command group should have been more involved in the direction of their focus groups.'*
- *'There seemed to be ineffective communication between the various focus groups through out the exercise.'*

- *'More time needed for intergroup interaction to avoid work duplication. ICS (= Incident Command Structure) could have been used more effectively.'*
- *'The communication between agencies and focus groups was weak. However, I think that highlighted the need for better communication in the future.'*

During pre exercise activities, it was agreed upon between initiative takers and the exercise planning team that the so called Incident Command System (ICS) would not be applied for this exercise. This ICS is a structure of communication lines during an (foreign) animal disease outbreak event (Foreign Animal Disease Emergency Response Plan, 2008). Because the RVF exercise was designed to educate and train participants about this foreign animal disease and important issues in the control of a vector borne disease, it was concluded that applying the ICS structure would introduce another difficulty because different participants are familiar on a variety of levels with this system. For example, the Department of Health is not included in this the ICS but they were a very important stakeholder at this exercise. It would be too early to apply ICS for a RVF exercise, which maybe can be an option for future RVF exercises.

Having said this, when analyzing the comments made and when looking at the mean score appointed to question number twenty-three, it seems like overall a clear leadership and therefore structure of communication was lacking and that the ICS has not yet matured such that it can be easily implemented during an animal disease outbreak with a zoonotic component. The Incident Command and Focus Groups at least did not apply this system whilst they were free to do so.

This exercise highlighted the need for incorporation of the human health side stakeholders into a command structure when responding to a zoonotic disease outbreak.

The other mean scores in this section pointed out that the emails received from the organization prior to the exercise were sufficiently informative and that the length of the exercise was agreed on as appropriate. Furthermore, participants had the opinion that the relevant agencies were in attendance and that the appointment of a facilitator and rapporteur per group was helpful in the organization of the group. The contributions of the Expert Panel were viewed as helpful by the participants. This then brings us to question number twenty-eight, from which can be concluded that most participants thought the use of power point for reporting back to Incident Command and other Focus Groups was helpful. Fewer participants thought the use of the four headings for reporting (issues of concern; information gathered; action options and recommendations) was helpful. Some comments reflect that overall positive opinion concerning the standardized format:

- *'The standardized headings kept it moving and helped to focus the groups, but it may have also kept them focused on their issues and not of the group as a whole.'*
- *'It was difficult to provide reports in the standardized format due to time constraints and lack of interest, initially, in utilizing the format provided. In a true ICS structure, this format could be utilized successfully.'*
- *'Reporting using PowerPoint with a standard reporting format was extremely helpful to provide consistent, practical reporting back to the group and also provide additional structure to the investigation.'*

From to score appointed to question number thirty-one it can be concluded that there was sufficient help from the Exercise Planning Tem when a problem occurred.

The last question in this section calls for some discussion, as it received a somewhat low score relative to the other scores in this section and because some comments were made about it. The statement was about whether the workbook questions were helpful to focus discussion and follow up during breakout sessions. The mean score this question received was 3.90, so most participants agreed to the statement. Comments made about the subject of the workbook questions were made:

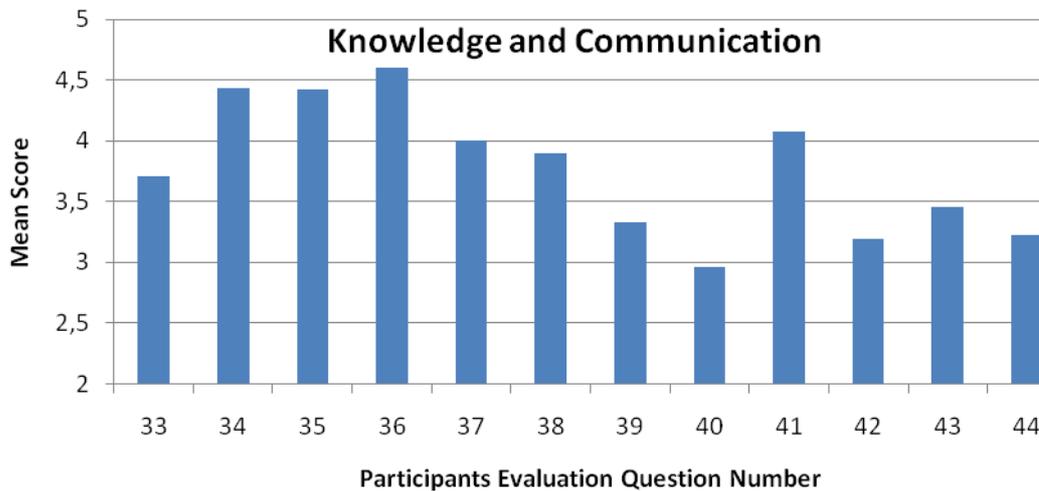
- *'I think our group could have better utilized the workbook questions to guide our responses and actions.'*
- *'Our group spent more time discussing the workbook questions than participating in the real time exercise.'*
- *'They were definitely great questions to contemplate in the situation; however, at first, I think our group spent too much time focusing on the questions in the workbook instead of acting on or reacting to the information that we had been given (which we improved upon).'*
- *'We often ignored the workbook questions and suggested report format in order to report on what we were actually doing.'*

In the workbook and in the presentation about the structure and rules, it was made clear that the questions served simply to stimulate discussion and to supplement direction to the Incident Command group and were not meant to be specifically addressed when reporting back. From the comments it can be concluded that the different groups handled the questions in different ways, and that the questions were seen as more useful by some participants than by others. The idea of the exercise planning team was that both the questions and the situation information should be considered in interactions and response.

The second comment must be viewed as negative; it was definitely not the intention of the questions to deflect attention from the real time events. In this group this must have not been totally clear, so a point for future exercises like this is to thoroughly emphasize the goal of the questions.

Knowledge and Communication

Following the mean scores appointed to the question in the fourth section, interesting outcomes will be summarized and analyzed.



This fourth section deals with an important part of the evaluation, because three of the five stated objectives can be analyzed from the scores and comments made in this part.

By giving question thirty-three a mean score of 3.71 out of 5, participants show that the level of knowledge of the ecology and transmission of RVF virus prior to the exercise was not optimal for everyone. More interestingly, question thirty-five received a more positive score of 4.42, from this it can be concluded that the knowledge of the RVF ecology increased as the exercise proceeded. By giving question thirty-four a mean score of 4.44, participants express that the RVF website was useful in their preparation for the exercise, assisting in the raise in knowledge of RVF in the proceedings of the exercise. The following comments support the fact that the website was a useful tool in preparing for the exercise:

- *'Website was an excellent resource for RVF information. The team went to great lengths to provide resources up front to facilitate the disease response efforts. The entire presentation was very realistic, interactive and informative.'*

The score appointed to question number thirty-six, supports the objective that the exercise helped raise awareness about the economic impact RVF can have were it ever to be introduced into Florida.

Question thirty-seven received a relatively high score of 4.00, saying that participants experienced the communication within their Focus Group or Incident Command as effective. According to the score given to question thirty-eight, most participants in a group were involved in discussion.

On the other hand, when reviewing the scores appointed to question thirty-nine and forty, there was not a very clear distribution of tasks within the groups and the communication with other Focus Groups and Incident Command was viewed as not very effective. Especially interesting is the climb in score between question forty and forty-one, from 2.96 to 4.08. These questions relate to each other because question forty asks if the communication with other Focus Groups and Incident Command was effective and question forty-one then asks whether this communication improved as the exercise proceeded. The difference in scores between these two questions shows that the inter-agency communication is still not optimal, but that it did definitely improve during this exercise. This must be viewed as a very interesting finding, because part of the goal of this exercise was to train the capability of multiple stakeholders to collaborate in responding to an outbreak of a foreign animal disease with a zoonotic component. The following comments reflect which methods were applied to improve communication between Focus Groups and Incident Command as the exercise proceeded:

- *'The IC had the focus groups send representatives to meetings prior to the powerpoints so there would be discussion and exchange of information. This helped to improve the communication as the exercise went on.'*
- *'Initial communication was chaotic causing some people to "drop-out" of the exercise. The change in communication with the Incident Command later on in the second day helped focus the individual groups.'*
- *'One of the initial break downs of my group was the lack of involvement with other groups, as we tried to give the other groups the chance to investigate and give direction on what was needed in "quarantines". It was obvious that initially there was little to no communication with the actors, or that if communication was occurring, there was little to no sharing of information with other groups. By the afternoon of the first day, Law Enforcement designated one person to liaison with health and animal to get details, and ask for direction on what they wanted in quarantines. By the second morning, information was flowing.'*
- *'This exercise proved the need to inter-mingle personnel from groups as quickly as possible so info sharing could be expedited.'*
- *'Our group struggled with communication the first day, and we had multiple people gathering exactly the same information. It improved a lot the second day. Another issue that also improved the second day was the communication with other groups, who were also calling the same people as we were and getting the same exact information - with very little sharing going on.'*

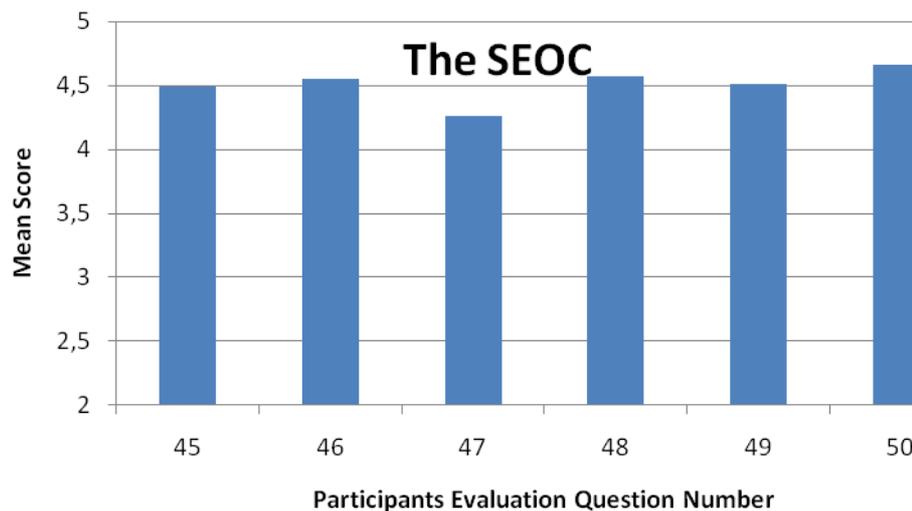
Questions forty-two received a score of 3.19, from which can be concluded that the development of a website by exercise participants would accommodate the flow of information amongst Focus Groups and Incident Command was viewed as neutral by most participants. A website to inform the general public and thus making Focus Groups and Incident Command aware of the information that was released to the public also received a relatively neutral score, namely 3.45. It was expected by the exercise planning team that both websites would have been developed in the proceedings of the exercise, and would be essential in good communication between groups and with the public. These scores say that most participants do not have a strong opinion about this idea. When a website is not seen as a good tool to facilitate good communication with other groups and with the public, there is a need for other tools because these communications were both weak points in the exercise. As is reflected by the following comment:

- *‘Although some draft press releases were prepared, there was not sufficient time to draft releases, vet them by appropriate groups, and review them for approval by IC.’*

When interpreting question forty-four, which was 3.22, it can be concluded that the different groups did not use the GIS and mapping potential of the SEOC to the fullest.

The State Emergency Operations Center (SEOC)

As can be concluded from the following chart, the SEOC was overall seen as a very suitable location for such an exercise.



The use of the central room of the SEOC for presentations was seen as effective, and the availability of breakout rooms during breakout sessions was also seen as effective as reflected by the following comments:

- *‘The center was an excellent choice overall.’*
- *‘Good facility and an excellent and responsive staff.’*
- *‘Was a good working space, breakout rooms helpful to reduce background noise.’*

The technical support from the SEOC staff was scored as very effective. Also, the lunches and refreshments were experienced as enjoyable and the fact that they were provided in house facilitated the flow of the exercise, as can be concluded from the score appointed to question fifty.

Discussion and recommendations

The Florida Department of Agriculture and Consumer Services tabletop exercise involving an introduction of Rift Valley fever into Florida successfully met the goal and objectives established prior to the exercise. Therefore the H0, as stated in the summary, can be accepted. The exercise effectively gave participants the opportunity to learn about the appropriate response to a suspected bioterrorist attack and brought together key agencies that would be involved in a response to a vector-borne zoonotic disease outbreak in Florida. It allowed participants to explore the issues relating to the biological complexity of RVF and explore diagnostic and response capabilities of Florida's diagnostic laboratories, CDC and Plum Island Animal Disease Center. The participants and the Expert Panel agreed that the exercise was appropriately designed and conducted to achieve these goals and that it constituted an adequate challenge to stimulate further progress in these areas.

The participants and designers learned many lessons through the exercise. Key recommendations for response include:

- Develop methods to improve communication between groups involved in a vector-borne zoonotic disease outbreak.
- Develop methods to effectively incorporate experts not currently represented into the Incident Command System in zoonotic disease outbreak situations.
- Provide continued and additional training to enhance response to bioterrorism involving a zoonotic agent.

Through the evaluations, a large amount of information was collected addressing the quality of the scenario and exercise. Recommended areas for modification for future exercises include:

- Clearly identify expectations of the participants at the onset of the exercise, and continue to clarify these expectations throughout the exercise.
- Provide more training on the technical capabilities of the SEOC and how they are utilized within the exercise.
- Special emphasis should be placed on developing crisis communication and public relations.

The Department of Agriculture and Consumer Services and other participating agencies can use the results of this exercise to strengthen identified weaknesses, refine policies and procedures that affect a response to a vector-borne zoonotic disease outbreak and explore the agencies' role in a bioterrorist event involving human and animal victims. Once changes are implemented, agencies should conduct additional exercises to continue to foster education on vector-borne zoonotic diseases, communication between agencies and further evaluate and identify agency response capabilities.

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APPENDIX A: LIST OF SCHEDULED PARTICIPANTS

Blue Mountain Fever Exercise Participants and Focus Groups

Participating Agencies

State

DOACS	Department of Agriculture and Consumer Services
DOACS/AES	DOACS/Division of Agricultural Environmental Services
DOACS/DAI	DOACS/Division of Animal Industry
DOACS/DOD	DOACS/Division of Dairy
DOACS/DFS	DOACS/Division of Food Safety
DOACS/DOF	DOACS/Division of Forestry
DOACS/OALE	DOACS/Office of Agricultural Law Enforcement
DOACS/OGC	DOACS/Office of the General Council
DEM	Division of Emergency Management
DEM/SCO	DEM/State Coordinating Officer
DEM/SERT Chief	DEM/State Emergency Response Team Chief
DOH	Department of Health
FCA	Florida Cattlemen's Association
FNG	Florida National Guard
FWC	Florida Fish and Wildlife Conservation Commission
FVMA	Florida Veterinary Medical Association

Federal

DHS	Department of Homeland Security
FBI	Federal Bureau of Investigation
HHS/CDC	Health and Human Services/Centers of Disease Control
SCWDS	Southeastern Cooperative Wildlife Disease Study
USDA/APHIS	United States Department of Agriculture/Animal and Plant Health
Inspection	Service
USDA/APHIS/AC	USDA/APHIS/Animal Care Service
USDA/APHIS/LPA	USDA/APHIS/Legislative and Public Affairs
USDA/APHIS/NVS	USDA/APHIS/National Veterinary Stockpile
USDA/ASPHIS/WS	USDA/APHIS/Wildlife Services
USDA/APHIS/VS	USDA/APHIS/Veterinary Services
USDA/ARS	USDA/Agricultural Research Service

Foreign

IAH/PL	Institute for Animal Health/Pirbright Laboratory, UK
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Incident Command/Policy Group

Shared Incident Commanders:

DOACS/DAI	Tom Holt
USDA/APHIS/VS	Terry Taylor
DOH	Tom Belcuore

DEM Leadership:

DEM/SCO	Craig Fugate
DEM/SERT Chief	Doug Wright

Group Participants:

DOACS/DAI	Leigh Humphreys, David Perry
DOACS/DOF	Ralph Crawford
DEM	Linda McWhorter, Shanti Smith
FCA	Gene Lollis
USDA/APHIS/NVS	Glen Garris
FVMA	Jan Hasse
DOH	Ron Burger

Focus Group A - Animal Health and Laboratory Issues

Facilitators:

Dix Harrell (USDA/APHIS/VS) and Diane Kitchen (DOACS/DAI)

Group Participants:

DOACS/DAI	Pam Hunter, Gary Painter, Ed Poppell, Julie Hinote, Bruce Vickers, Dana DeJarnett, Peter Scott, Alice Agasan, James Maxwell, Karen McKenzie
USDA/APHIS/VS	Sue Loerzel
USDA/APHIS/AC	Greg Gaj
USDA/APHIS/WS	Michael Milleson
USDA/APHIS/NVS	Michael Gallagher
FWC	Mark Cunningham, Elina Garrison, Dan Wolf
DOACS/DOF	Daniel Stanley
SCWDS	Joe Corn
DHS	Mary Jo Baarsch
DEM	Pam Hughes

Focus Group B - Human Health and Laboratory Issues

Facilitator:

Carina Blackmore (DOH)

Group Participants:

DOACS/DAI	Sam Lamb
DEM	Tim Mazanek, Ray Runo
DOH	Danielle Stanek, Rebecca Shultz, Patrick Gardner, Lauren Ball, Janet Hamilton, Lillian Stark, Kristina Weis
DOACS/DFS	John Fruin, Audrey Bauer
DOACS/DOD	Gary Newton
HHS/CDC	Pierre Rollin
FNG	Tecarie Czarnecki

Focus Group C - Quarantines, Law Enforcement and Legal Issues

Facilitators:

Lou Leinhauser (DOACS/OALE), Bill Jeter (DOACS/DAI)

Group Participants:

DOACS/DAI	John Court
DOACS/OALE	Cheryl DeGroff, Jerry Bryan, Bob Johnson, David Rigdon
DEM	Tom Congdon
FWC	John West, Linda Harrison
DOACS/OGC	David Young
FBI	Mark Young

Focus Group D - Entomology, Mosquito Control and Meteorology Issues

Facilitators:

Steve Dwinell (DOACS/AES), Joe Kight (DOACS/DAI)

Group Participants:

DOACS/DAI	John Crews, Aissa Sylla
DOACS/AES	Weldon Collier, Tom Loyless, Jim Cooper, Dale Dubberly
DEM	Brian Richardson

Focus Group E - Crisis Communication and Public Relations Issues

Facilitators:

Liz Compton (DOACS/Commissioner's Office), Susan Smith (DOH)

Group Participants:

DOACS/DAI	Mike Short, Stephen Monroe
DEM	Mike Stone
FWC	Carol Pratt, Tony Young
USDA/APHIS/LPA	Jim Barrett

Expert Panel

HHS/CDC	Tom Ksiazek
USDA/ARS	Kenneth Linthicum
IAH/PL	Peter Mertens
University of Florida	Glenn Morris
FBI	Steve Goldsmith
DOACS/DAI	Greg Christy

Exercise Planning Team

University of Florida	Paul Gibbs
University of Florida	Stasia Bembenek
University of Florida	Tineke Kramer
University of Florida	Jocelyn Ramey

Exercise Support

DEM/Training	Necole Holton, Yvonne Birriel
DEM/Meteorology	Amy Godsey
DEM/GIS	Erika Pittman
DEM/IT	Kevin Smith
DEM/AV	Steve Levine, John Fleming
DOACS	Fred Jones, Kent Cain, Anne Vuxton, Candy Sheridan

APPENDIX B: EXERCISE PROGRAM

Program

Tuesday November 18, 2008

Day	Time	Event
2		Response Team convenes in SEOC Tallahassee
	8:00 - 8:30	Registration
	9:00 - 9:15	Welcome : Tom Holt and Craig Fugate
	9:15 - 9:30	“Rules” for the Scenario
		Situation Report 1
	9:30 - 10:00	Instruction from Incident Command (IC) & questions
	10:00 - 10:15	Break Out Session 1 (with coffee)
	10:15 - 11:00	Reports & Recommendations to IC
	11:00 - 11:30	Response from IC
		Situation Report 2
	11:30 - 12:00	Instruction from Incident Command (IC) & questions
	12:00 - 12:15	Break Out Session 2 (box lunches)
	12:15 - 2:00	Reports & Recommendations to IC
	2:00 - 2:45	Response from IC
		Situation Report 3
	2:45 - 3:15	Instruction from Incident Command (IC) & questions
	3:15 - 3:30	Break Out Session 3
3:30 - 4:30	Reports & Recommendations to IC	
4:30 - 5:00	Response from IC	

Wednesday November 19, 2008

Day	Time	Event
3	8:30 - 8:40	Response Team re-convenes in SEOC Tallahassee Welcome : Honorable Charles H. Bronson Florida Commissioner for Agriculture Coffee
	9:00 - 9:30	Situation Report 4
	9:30 - 10:00	Instruction from Incident Command (IC) & questions
	10:00 - 11:00	Break Out Session 4 (with coffee)
	11:00 - 12:00	Reports & Recommendations to IC Response from IC
	12:00 - 1:30	Lunch
5	1:30 - 2:00	Situation Report 5
	2:00 - 2:30	Instruction from Incident Command (IC) & questions
	2:30 - 3:30	Break Out Session 5
	3:30 - 4:30	Reports & Recommendations to IC Response from IC
21	4:30 - 5:00	Situation Report 6
	evening	BBQ, Time and Place to be Announced

Thursday November 20, 2008

Day	Time	Event
		Response Team convenes in SEOC Tallahassee
	8:30 - 9:00	Discussion of timeline and events with scenario writers
	9:00 - 9:30	Video Conference with Dr Koos Coetzer, South Africa
	9:30 - 9:45	Break
	9:45 - 11:00	Expert Panel Review of Exercise
	11:00 - 11:30	Agro-terrorism Response Issues Sam Mum - FBI WMD Coordinator
	11:30 - 1:00	Lunch
	1:00 - 3:15	Resource Identification and Acquisition Panel Michael Gallagher - USDA/APHIS/NVS Terry Taylor - USDA/APHIS/VS Ralph Crawford - Florida Division of Forestry Tad Warfel - Florida National Guard Chuck Hagen - Florida Division of Emergency Management
		Presentations from Agencies
	1:00 - 1:15	Florida Division of Forestry
	1:15 - 1:30	Florida National Guard
	1:30 - 1:45	Florida Division of Emergency Management
	1:45 - 2:15	USDA National Veterinary Stockpile/3D programs
	2:15 - 2:45	USDA Incident Management Teams
	2:45 - 3:15	Panel discussion and questions
	3:15 - 3:30	Break
	3:30 - 4:30	Emergency Declarations Panel Glen Garris - USDA/APHIS/NVS TBA - Florida Division of Emergency Management Jesse Munoz - Florida Division of Emergency Management
	4:30	Closing Remarks

APPENDIX C: EXPERT PANEL EVALUATION FORM

Evaluator: _____ **Focus Group Observed:** _____

This evaluation form is designed to (a) assess the realism of the exercise (b) the responses of individuals within the Focus Groups and (c) the interagency effectiveness of the Focus Groups.

This form is to be used to evaluate only one Focus Group. To assist the writing of the After Action Report we would ask you to complete the evaluation once Situation Report 6 has been presented.

To assist you in completing sections A. and B. of this evaluation we suggest that you may wish to log in individual problems recognized during each of the Break Out sessions. This log starts on page six of this form.

An electronic form of this evaluation is available on each of the computers in the Expert Panel section. If you require assistance, please see Ms Tineke Kramer.

Thank you!



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Evaluator: _____ **Focus Group Observed:**_____

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Thank you!



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APPENDIX D: PARTICIPANT EVALUATION FORM

Name		
Email		
Job Title and Agency		
Tel		
Select your Group	<input type="checkbox"/> Expert Panel <input type="checkbox"/> Incident Command <input type="checkbox"/> Focus Group A (animal health) <input type="checkbox"/> Focus Group B (human health)	<input type="checkbox"/> Focus Group C (quarantines etc) <input type="checkbox"/> Focus Group D (entomology etc) <input type="checkbox"/> Focus Group E (crisis communications etc)

Dear Rift Valley Fever Exercise Participant,

This evaluation form seeks your opinion concerning the Rift Valley Fever Training Exercise, as held from 18-20 November 2008 at the State Emergency Operations Center in Tallahassee, Florida.

The questionnaire consists of 50 directed questions and space for your comments. You are not obliged to provide your name, but we would like to know your group. We want to make our After Action Report as accurate as possible with specific recommendations for a) the optimal control of RVF were it ever to enter the USA and b) future exercises of a similar nature.

Please click on the appropriate box to indicate your response. Once you have completed the survey, please save and identify your response file as YOURNAME_RVF_Exercise_Survey and attach it to an email to pgibbs@ufl.edu. If you wish to remain anonymous, send it as a fax to Paul Gibbs at (352) 392-9704. Some questions may not apply to you, especially if you were in the Expert Panel group. In such cases, please click "Not Applicable" (NA).

We recognize that you are receiving this request shortly after Thanksgiving and that your inbox is probably overflowing. The After Action Report must be submitted within three weeks of the exercise, so an early response will be greatly appreciated.

Thank you!

*Paul Gibbs, Greg Christy, Stasia Bembenek, Tineke Kramer and Jocelyn Mullins
-Exercise Planning Team*



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1. General Overview of the Exercise

Please check one of the following on the scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree or NA = Not applicable

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>NA</u>
1. Overall, the exercise was educational and well organized	<input type="checkbox"/>					
2. The exercise raised my awareness of the threat of RVF to Florida	<input type="checkbox"/>					
3. After participating in this exercise, I am better prepared to respond to a vector borne zoonotic disease incident in Florida	<input type="checkbox"/>					
4. This exercise educated me on the issues surrounding the control of a vector borne zoonotic disease	<input type="checkbox"/>					
5. After participating in this exercise, my agency is better prepared to respond to a vector borne zoonotic disease incident in Florida	<input type="checkbox"/>					
6. The video conference discussion with Dr Koos Coetzer on day 3 was useful to learn about RVF in an endemic situation	<input type="checkbox"/>					

Please comment on the above responses (max 2000 characters):

2. The Scenario and Presentation

Please check one of the following on the scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree or NA = Not applicable

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>NA</u>
7. The scenario came across as plausible	<input type="checkbox"/>					
8. The use of real locations increased my motivation to engage in the scenario	<input type="checkbox"/>					
9. The “real time” nature of the first 30 hours of the exercise was engaging as it more closely reflected the reality of an outbreak	<input type="checkbox"/>					
10. The scenario was appropriately, but not excessively challenging	<input type="checkbox"/>					
11. The number of “injects” into the scenario was about right	<input type="checkbox"/>					
12. The use of actors and their contact information in the scenario brought greater realism to the exercise	<input type="checkbox"/>					
13. The requirement that the actors had to be contacted for information to “drive” the exercise forward was effective	<input type="checkbox"/>					
14. The presentation of Situation Reports using PowerPoint was more effective than a paper narrative	<input type="checkbox"/>					
15. The embedded video in the Situation Reports was more effective than a paper narrative in illustrating the scenario	<input type="checkbox"/>					
16. The Workbook was easy to use	<input type="checkbox"/>					
17. Providing copies of the Situation Reports (Powerpoint presentations) as hand outs in the Workbook provided easy access to information	<input type="checkbox"/>					
18. My Group accessed the password protected Powerpoint files on the computers available to us	<input type="checkbox"/>					
19. My Focus Group found the opportunity to review the Powerpoint files helpful when viewed on the computers	<input type="checkbox"/>					

Please comment on the above responses (max 2000 characters):

3. The Organization of the Exercise

Please check one of the following on the scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree or NA = Not applicable

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>NA</u>
20. The Exercise Planning Team came across as professional and well prepared	<input type="checkbox"/>					
21. The emails received from the organization prior to the exercise were sufficiently informative	<input type="checkbox"/>					
22. The length of the exercise (2 days) was appropriate	<input type="checkbox"/>					
23. The Incident Command and Focus Groups structure allowed for faster inter agency communication	<input type="checkbox"/>					
24. The relevant agencies were in attendance	<input type="checkbox"/>					
25. The appointment of a Facilitator helped organize the group	<input type="checkbox"/>					
26. The appointment of a Rapporteur helped record the activities of the group	<input type="checkbox"/>					
27. The contributions of the Expert Panel were helpful	<input type="checkbox"/>					
28. The use of a reporting form as a PowerPoint file was an effective tool to record and report back to the Incident Command and other Focus Groups	<input type="checkbox"/>					
29. The standardized use of 4 headings for reporting (Issues of Concern; Information Gathered; Action Options; Recommendations) was helpful	<input type="checkbox"/>					
30. Saving the reports to the network was simple	<input type="checkbox"/>					
31. There was sufficient help from the Exercise Planning Team when a problem occurred	<input type="checkbox"/>					
32. The Workbook questions were helpful to focus discussion and follow up during Break-out Sessions	<input type="checkbox"/>					

Please comment on the above responses (max 2000 characters):

4. Knowledge and Communication

Please check one of the following on the scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree or NA = Not applicable

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>NA</u>
33. Prior to being informed of this exercise, I had little knowledge of the ecology and transmission of Rift Valley fever virus	<input type="checkbox"/>					
34. The RVF website was useful in my preparation for the exercise	<input type="checkbox"/>					
35. My knowledge of the RVF ecology in areas where it has occurred, increased as the exercise proceeded	<input type="checkbox"/>					
36. My knowledge of the potential ecology and economic impact of RVF were it to be introduced into Florida, increased as the exercise proceeded	<input type="checkbox"/>					
37. Within my Focus/ Incident Command (IC) Group, the communication was effective	<input type="checkbox"/>					
38. Within my group, all members were involved in discussion	<input type="checkbox"/>					
39. There was a clear distribution of tasks within my group	<input type="checkbox"/>					
40. Communication with other Focus Groups and the IC was effective	<input type="checkbox"/>					
41. Communication with other Focus Groups and the IC improved as the exercise proceeded	<input type="checkbox"/>					
42. The development of a website by the exercise participants would have assisted the flow of communication amongst Focus Groups and the IC	<input type="checkbox"/>					
43. The development of a website by the exercise participants to inform the general public would have assisted the Focus Groups and IC in being aware of what information had been released to the public	<input type="checkbox"/>					
44. My group used the GIS and mapping potential of the SEOC	<input type="checkbox"/>					

Please comment on the above responses (max 2000 characters):

5. The State Emergency Operations Center (SEOC)

Please check one of the following on the scale of 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree or NA = Not applicable

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>NA</u>
45. The selection of the SEOC facility was effective for this exercise	<input type="checkbox"/>					
46. The use of the central room of the SEOC for presentations was effective	<input type="checkbox"/>					
47. The use of Break-out space was effective	<input type="checkbox"/>					
48. The technical support from the SEOC staff was effective	<input type="checkbox"/>					
49. The lunches and refreshments were enjoyable	<input type="checkbox"/>					
50. Arranging the lunches and refreshments in house, facilitated the flow of the exercise	<input type="checkbox"/>					

Please comment on the above responses (max 2000 characters):

6. Recommendations (max 3000 characters)

- What steps do you feel the participating agencies need to take in order to better prepare for a unified response to a vector borne zoonotic disease incident?

Thank you for taking the time to complete this survey! Please save and identify your response file as **YOURNAME_RVF_Exercise_Survey** and attach it to an email to pgibbs@ufl.edu. If you wish to remain anonymous, send it as a fax to Paul Gibbs at (352) 392-9704.

APPENDIX E: EVALUATION FORM DATA

I. Expert Panel Evaluation

A. Average Likert Scores for Questions on Expert Panel Evaluation (1= Poor, 5 = Excellent). See Appendix C for the evaluation form.

Question Number	1	2	3	4	5	6	7	8	9	10
Likert Score	4.83	4.83	4.0	3.83	4.4	4.33	4.17	4.17	4.17	3.17

B. Comments by Expert Panel members

- *'The group was more than adequately challenged by the scenario'*
- *'Recognized events as very serious challenge & potential for heavy Law Enforcement response – State, Federal'*
- *'Events were considered realistic based on previous disease requirements – Brucellosis, TB, PRV etc in feral swine'*
- *'Initially the scenario did not particularly challenge this Focus Group. The initial response followed the normal lines of response to something like West Nile Virus detection. However, as the situation developed and the significance of RVF detection and the potential for an RVF outbreak became clear the Focus Group became more challenged. The Focus Group quickly responded by enhancing surveillance and control efforts significantly beyond normal response efforts.'*
- *'The events were perceived as realistic by the group, although the events were complicated and not easily understood during the exercise and were not clear until the final Situation Report.'*

II. Participant Evaluation

A. Likert Scores for Questions on Participant Evaluation (1= Strongly Agree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree). See Appendix D for the evaluation form.

Average Likert Scores for Questions 1-6 relating to the general overview of the exercise.

Question Number	1	2	3	4	5	6
Likert Score	4.5	4.4	4.2	4.4	4.1	4.3
	2	9	3	2	1	9

Average Likert Scores for Questions 7-19 relating to the scenario and presentation.

Question Number	7	8	9	10	11	12	13	14	15	16	17	18	19
Likert Score	4.24	4.61	4.42	4.06	4.14	4.48	4.41	4.51	4.54	4.57	4.70	3.77	3.58

Average Likert Scores for Questions 20-32 relating to the organization of the exercise.

Question Number	20	21	22	23	24	25	26	27	28	29	30	31	32
Likert Score	4.75	4.40	4.35	3.29	4.39	4.26	4.56	4.29	4.36	3.96	4.15	4.45	3.90

Average Likert Scores for Questions 33-44 relating to the knowledge and communication.

Question Number	33	34	35	36	37	38	39	40	41	42	43	44
Likert Score	3.71	4.44	4.42	4.60	4.00	3.90	3.33	2.96	4.08	3.19	3.45	3.22

Average Likert Scores for Questions 45-50 relating to the Florida State Emergency Operations Center.

Question Number	45	46	47	48	49	50
Likert Score	4.49	4.55	4.26	4.57	4.51	4.66

C. Comments by Participants

- *‘This was a fantastic effort and remarkable how smoothly the planners and facilitators made this complex exercise work! Enjoyable and educational both. Wonderful to have national and international leaders in RVF participating and available for questions!’*
- *‘This is the 1st time that I have assisted with and participated in an exercise that was so well put together and I greatly appreciate the opportunity.’*
- *‘The exercise was very well organized and managed and time management was very effective.’*
- *‘Very well thought out and conducted. Use of videos, maps, and real places and people made it seem plausible and hit close to home.’*
- *‘I have participated in many table top exercises and found this one to be one of the best I have ever participated in. I feel the program was designed to maintain the interest of the participant and not just a work book exercise.’*

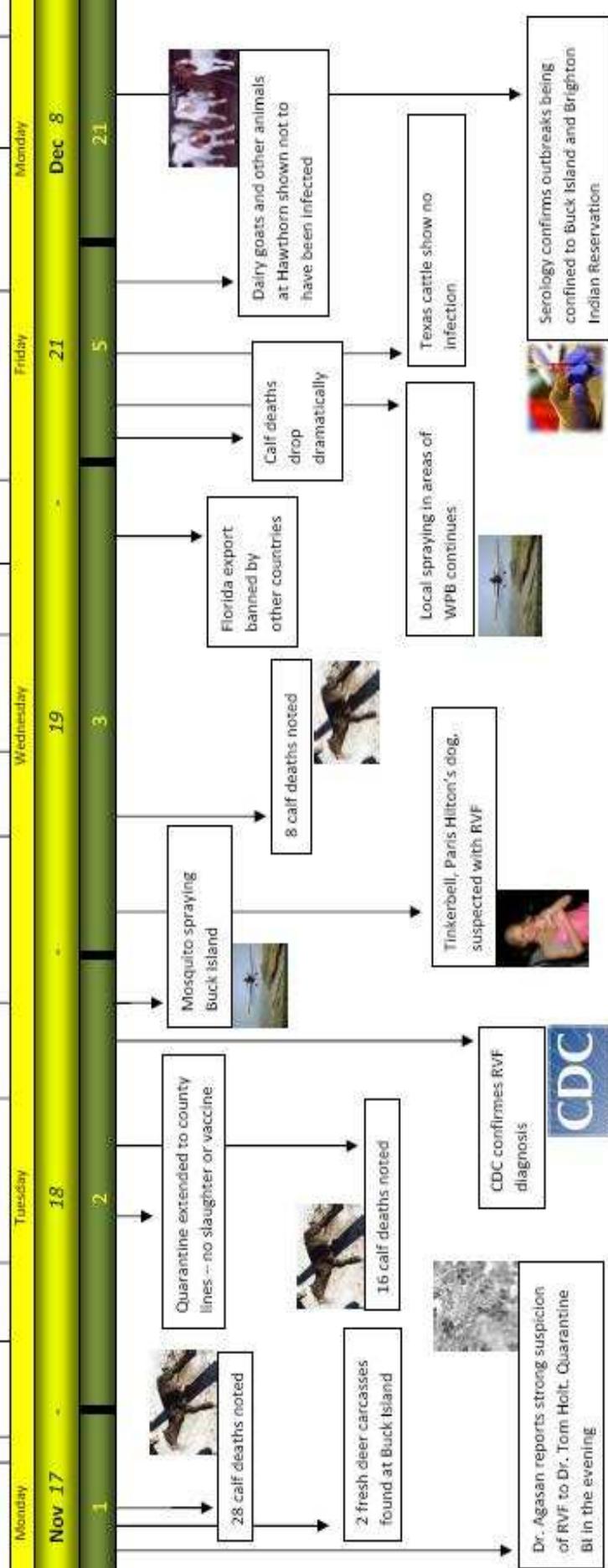
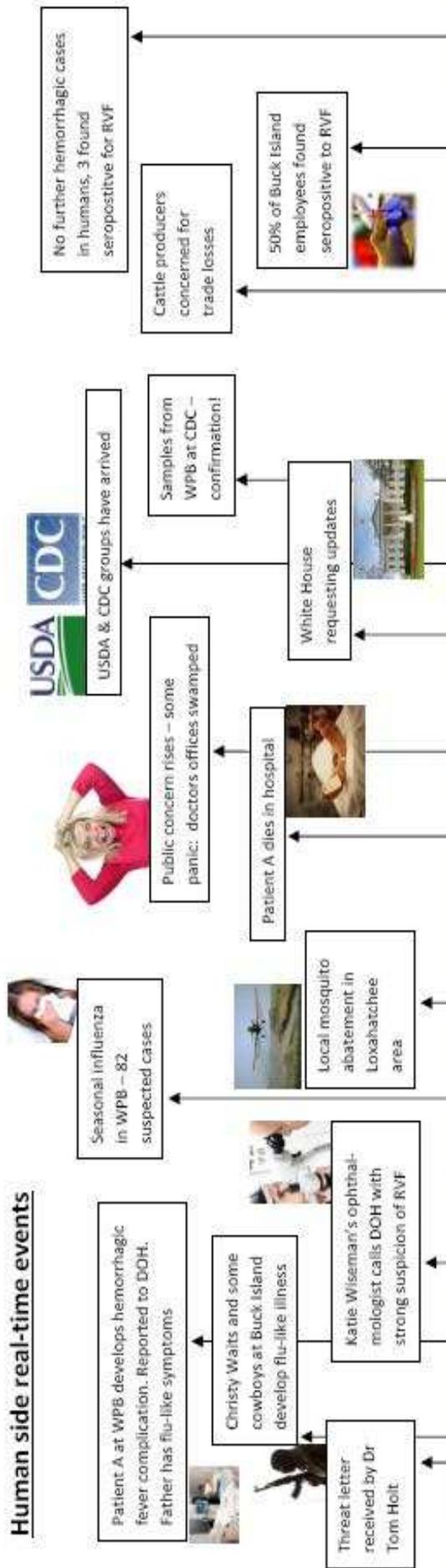
- *Excellent!! This exercise was well planned and thought out. Incorporation of video discussion with field experts dealing with RVF in real life provided an invaluable training tool for the exercise participants.*
- *'I have participated in only 2 really excellent emergency response exercises in my 29 year career. This was one of them. I think others in my agency could benefit from participation in this exercise. Perhaps it could be run again in a different state and more APHIS, VS personnel invited? This is the only exercise senario I have participated in that involved a vectored foreign animal disease which was also a public health hazard. The interaction of animal health officials with mosquito control officials and public health officials was enlightening. The timeline in this exercise (usually a weakness that contributes to an unrealistic atmosphere) was reasonable and practical.'*
- *'This exercise brought out many areas within our response methods that must be improved before we respond to a disease outbreak such as this.'*
- *'While I think that overall this was an excellent exercise; I feel more work need to be done to actually garner an adequate response.'*
- *'This exercise enabled us to better assess capacity and capability to perform our functions in such a situation.'*
- *'Overall, I felt that the exercise was very well presented and organized. Now, I feel that I would be better able to participate in a real life event now that I have been through this training.'*
- *'Additional time to discuss RVF with Dr. Koos Coetzer would have been beneficial.'*
- *'I think that having Dr. Coetzer talk to us about RVF was a great touch. In some ways, presenting a senerio like this RVF excersise may not be as real to someone like me that is new to working in a government agency. Dr. Coetzer was able to put the gravity of an introduction of RVF to the US into perspective.'*
- *'The video conference with dr. Coetzer was exceptional. I feel that the overall exercise was beneficial to many new participants in the evolution of preparedness in Florida.'*
- *'The scenario was very well organized. Great job! Best exercise I have been a part of.'*
- *'I liked the concept of real time roll play in this event, and the fact that interaction between the actors, and the groups, was necessary for the event to progress. I believe that it brought to light to a couple of the groups the need to work together, share information, and be able to give clear direction on their needs.'*
- *'There was an expectation for exercise participants to interact with exercise "actors" and group facilitators in order to garner information to further facilitate the exercise. Early on in the exercise there seemed to be some confusion on the part of the exercise participants regarding this expectation. This interaction did, however, improve as the exercise progressed.'*
- *'It may be beneficial to more clearly define all roles for the exercise and the expectations of the exercise participants (for this interaction) when initially setting the stage for the exercise. Provide additional time for breakout sessions would also be beneficial to allow particiapnts sufficient time to make necessary contacts and work through the scenarios.'*
- *'The actors or should I say the "real" people were a refreshing aspect of the drill. I believe that it took a while for the players to realize that this was for real as far as contacting those folks in play.'*

- *'Outstanding scenario and presentation. We did struggle with time constraints for intergroup communications and feedback.'*
- *'Although the scenario was plausible, there were limited opportunities for me to provide input related to my expertise. There were a couple references to areas that were relevant to AC (petting zoo and research animals) but they could not be pursued because of the limits imposed on the exercise.'*
- *'It did not appear that the ICS structure was being utilized at the onset of the exercise. Had the ICS structure been implemented immediately, I believe the Incident Command unit would have been more successful in fostering communication between its members as well as the focus groups.'*
- *'The Incident Command group should have been more involved in the direction of their focus groups.'*
- *'There seemed to be ineffective communication between the various focus groups through out the exercise.'*
- *'More time needed for intergroup interaction to avoid work duplication. ICS (= Incident Command Structure) could have been used more effectively.'*
- *'The communication between agencies and focus groups was weak. However, I think that highlighted the need for better communication in the future.'*
- *'The standardized headings kept it moving and helped to focus the groups, but it may have also kept them focused on their issues and not of the group as a whole.'*
- *'It was difficult to provide reports in the standardized format due to time constraints and lack of interest, initially, in utilizing the format provided. In a true ICS structure, this format could be utilized successfully.'*
- *'Reporting using PowerPoint with a standard reporting format was extremely helpful to provide consistent, practical reporting back to the group and also provide additional structure to the investigation.'*
- *'I think our group could have better utilized the workbook questions to guide our responses and actions.'*
- *'Our group spent more time discussing the workbook questions than participating in the real time exercise.'*
- *'They were definitely great questions to contemplate in the situation; however, at first, I think our group spent too much time focusing on the questions in the workbook instead of acting on or reacting to the information that we had been given (which we improved upon).'*
- *'We often ignored the workbook questions and suggested report format in order to report on what we were actually doing.'*
- *'Website was an excellent resource for RVF information. The team went to great lengths to provide resources up front to facilitate the disease response efforts. The entire presentation was very realistic, interactive and informative.'*
- *'The IC had the focus groups send representatives to meetings prior to the powerpoints so there would be discussion and exchange of information. This helped to improve the communication as the exercise went on.'*

- *'Initial communication was chaotic causing some people to "drop-out" of the exercise. The change in communication with the Incident Command later on in the second day helped focus the individual groups.'*
- *'One of the initial break downs of my group was the lack of involvement with other groups, as we tried to give the other groups the chance to investigate and give direction on what was needed in "quarantines". It was obvious that initially there was little to no communication with the actors, or that if communication was occurring, there was little to no sharing of information with other groups. By the afternoon of the first day, Law Enforcement designated one person to liaison with health and animal to get details, and ask for direction on what they wanted in quarantines. By the second morning, information was flowing.'*
- *'This exercise proved the need to inter-mingle personnel from groups as quickly as possible so info sharing could be expedited.'*
- *'Our group struggled with communication the first day, and we had multiple people gathering exactly the same information. It improved a lot the second day. Another issue that also improved the second day was the communication with other groups, who were also calling the same people as we were and getting the same exact information - with very little sharing going on.'*
- *'Although some draft press releases were prepared, there was not sufficient time to draft releases, vet them by appropriate groups, and review them for approval by IC.'*
- *'The center was an excellent choice overall.'*
- *'Good facility and an excellent and responsive staff.'*
- *'Was a good working space, breakout rooms helpful to reduce background noise.'*

APPENDIX F: VISUAL TIMELINE OF THE SCENARIO

Human side real-time events



Animal side real-time events

Human side prior events

