

Report of Meeting

Enhancing the Practical Diagnostic Capacities and Increased Awareness of a Group of Abortive Diseases and Neonatal Deaths in Small Ruminants and Cattle, in the MENA Region

**Jordan University of Science and Technology
Irbid, Jordan**

March 12-14, 2018

Coordinator and PI of the Regional Workshop: Nabil Hailat, DVM, Ph.D., JUST



Executive Summary:

Sheep and Goats Farmers from the Badia region of North Jordan, private (from NGOs) and public veterinarians (governments), and undergraduates and graduates' students (from Jordan, Palestine and Gaza and Iraq), from 6 countries in the MENA+ region (Algeria, Jordan, Palestinian authority, Tunisia, Turkey, and three professors from University of Georgia, Athens and University of T&M, USA) gathered in Irbid, Jordan, to present and discuss abortions and neonatal mortality problems in the region. Speakers from The Eastern Mediterranean Public Health Network (EMPHNET) also participated in this workshop and showed great support and enthusiasm of the subject. The Executive Secretary of the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA), also participated in this workshop and expressed his future support of such professional academic developmental programs. Four Professors from JUST participated and delivered key note lectures in the workshop. In addition, a speaker from the National Center for Agriculture Research and Extension (NCARE) came and participated in the workshop and discussed the issue of biosecurity and biosafety and risk assessment of animal diseases.

The main diseases which were presented and discussed were Brucellosis, Chlamydiosis, Toxoplasmosis, Entorotoxemia, Colibacillosis, Cryptosporidiosis, Coccidiosis, Salmonellosis, Corona and Rota viruses causing abortions and neonatal deaths resulting in economic losses to farmers and to the national economy, and some of which are zoonotic. The views of the farmers, the way that they see these diseases in the fields, affecting their animals, were delivered, discussed and feedback from the scientists from the participating countries was also presented and discussed in details. In conclusions, the farmer, the animal health technician, the veterinarian, and the laboratorian - all need to work together to help solve the puzzle of abortions and neonatal deaths. Human infection only requires 10-100 organisms and a small piece of infected placenta is likely to have 10^{12} organisms, and so biosafety and biosecurity are very important were emphasized.



For the agenda, see Appendix A, and for the list of attendees, see Appendix B

Monday, March 12

Opening Ceremony:

The chairman of the workshop, Prof. Nabil Hailat gave five minutes a welcome speech and thanked the participants for coming and participated in the workshop. The he introduced the Director of the Consultation Center who also gave a welcome speech and some ideas about the strategy of JUST. Two to three minutes' speeches were also presented from a representative of each country.



Director of the Consultation Center, Prof. Bashar Al-Omary.

Dr. Mohammad Ajlouni, Executive Secretary, AARINENA

Dr. Nabil Hailat, conference organizer, thanked the participants for taking time away from their work and their families to attend the workshop.

Dr. Corrie Brown, visiting scientist from U of Georgia,

Dr. Falah Sheidefat, Dean of the Faculty of Veterinary Medicine, Jordan

Session 1: Abortions – Overviews and International Perspectives

Chair: Professor Tammi Krecek (USA); Co-chair: Dr. Irfan Daskiran (Turkey)

An Overview of Animal Health Problems in Jordan

Dr. Mahmoud Hanatleh, CVO of Jordan, was unable to attend and so Dr. Mohammed AbuDulbooh gave remarks on his behalf. Jordan has approximately 4M sheep and goats, 70,000 head of cattle, and 1M chickens. There are ministry veterinarians throughout the country and a central laboratory at Jawa. Regional labs are now being developed and it is planned that PCR and ELISA testing will be available in Irbid later this year. It would be good to have the central lab certified for export purposes. Currently, due to the situation in Yemen and Jordan's lack of support for Saudi operations there, exports are diminished to KSA and overall monetary support from KSA is decreased. JOVAC is the largest vaccine company in the region and they supply most of the vaccines that are used in government programs (except FMD) in Jordan. JOVAC has many sales to other countries in the region and to nations throughout the African continent. Dr. Abu Dalbooh said one area for growth is to increase trust between the veterinarians and the farming communities.

Overview and Pathogenesis of Fetal Loss, Small Ruminants, Dr. Corrie Brown

Using animated power points, the transmission and pathogenesis of each of 5 major causes of sheep and goat abortions were demonstrated. Understanding how the agent causes disease can be central to ensuring that correct samples are taken, and also very helpful in implementing control programs.

Perspectives from the Farming Community

- A Bedouin animal health nurse attending the meeting discussed several problems. Last year there were many cases of FMD but the government did not have any vaccine. This year there is increased diarrhea and mortality in young lambs but she could not get the government veterinarians to come and look at the animals. She suggested that a committee be formed to discuss how to get better connections between the farming community and the government.
- Abu Abdullah, a sheep farmer from Mafraq, attended the PPR workshop held here last year and afterwards, followed the recommended protocols to protect his animals against this disease. He said that as a result he had far less mortality due to PPR this year and he feels that more farmers should follow government recommendations for vaccination. This year he has different problems – lambs are often weak and unable to stand, sometimes they have head tilt, then they die. Also he has more mastitis than in previous years, including many cases of “blue bag”.
- Mr. Wali, also a sheep farmer from Mafraq, feels that the farmers are well acquainted with the major diseases such as FMD, PPR, and pox. They know when to call the government and how to get help. A major problem he has had this year is in neonatal mortality, with death and weakness and animals dying at 1-2 days of age. He gives antibiotics to help with the diarrhea, but the lambs remain weak and never really progress.



Comments:

There was a general discussion about mating season. Mating occurs throughout the year. In years past, mating was confined to the May-July period, which made it easy to determine best

time to administer brucella vaccines. But now it is harder because mating period is not so well controlled, and sheep can be pregnant at any time of year, which makes vaccination for brucella challenging (vaccine is known to cause abortion).

A question was asked about what is done with the aborted fetus or newborn dead lamb and also the dam's milk. The farmers said that if the fetus has wool already, then the ewe has milk, so they milk her and send the milk to the factory for making cheese. Other farmers keep the milk for themselves, some boil it before consuming but others do not boil it.

Strengthening brucellosis surveillance, diagnosis and control in Jordan, Dr. Ekhlas Hailat, Zoonotic Project Manager, EMPHNET

This project is supported by CDC and is focused on Mafraq. Both Ministry of Agriculture and Ministry of Health are also involved. Last year 145 human cases of brucellosis were reported in Jordan, but the real number is probably at least quadruple that. In Mafraq alone, there were 90 cases, and of these 49 were housewives. The brucella bacteria can survive in soil for 3 months and in milk for 10 days.



EMPHNET has undertaken numerous training programs to help people in the region understand the dangers and prevent infection. Training has targeted women who make the cheese, veterinarians and human physicians, and the laboratories. The prevalence in the Mafraq area in animals is very high, due to many reasons – animals and humans moving in from Syria, the use of private clinics that do not report, and the reluctance of some farmers to vaccinate because of the belief that the vaccine will cause abortion or bad milk.

Brucellosis in small ruminant abortions – diagnostic testing, Dr. Angela Arenas, Texas A&M University, USA



Dr. Arenas emphasized the importance of a team approach to successfully diagnose abortions. The farmer, the animal health technician, the veterinarian, and the laboratorian - all work together to help solve the puzzle. Human infection only requires 10-100 organisms and a small piece of infected placenta is likely to have 10^{12} organisms, and so biosafety and biosecurity are very important. A side of the objectives of the workshop, The USA team helped the Jordanian researchers to diagnose some very important diseases which has not been diagnosed before. This will be published very soon for the first time. Furthermore, Before we started the workshop, The team from Texas A&M, gave two lectures to the fifth year students where the students interaction and appreciated their participation and contribution.

Bovine / Ovine / Camelid Abortions – General Approach, Dr. Abdelsalam Talafha, JUST

Dr. Talafha reviewed the Cornell abortion “kit” which consists of a survey/questionnaire ensuring that all aspects of the abortion are considered. He compared investigation of an abortion to monitoring a crime scene, where there are many clues that need to be assessed and processed at the moment. He emphasized that every abortion should be considered a herd

problem. He often suggests using oxytetracycline in the water for two weeks to help decrease abortions, once one occurs in the herd/flock. This does not cure the infection but it will help to decrease the numbers of abortion. The blind use of antibiotics may result in antibiotics residency, thus accurate and fast diagnosis is very essential.

Session 2: Abortions – Overviews and International Perspectives

Chair: Dr. Angela Arenas; Co-chair: Dr. Aymen Mamlouk

Toxoplasma as a zoonotic disease, Dr. Tammi Krecek, Texas A&M University, USA

Toxoplasma epitomizes One Health. One-third of the population of the world has been exposed to this parasite. Very little is known about toxoplasmosis in camels – they have antibodies, but there has been no documentation of any abortion due to Toxoplasma. The farmers at the meeting talked about the “cat disease” – they were very aware that cats in the environment can spread Toxoplasma to their sheep and goats to cause abortion.

Abortion in Jordan, Dr. Abudulbouh, MoA, Mafraq

Toxoplasma can be found in many placentas by PCR, but it is not yet known in how many it is the cause of the abortion. Brucella is of great concern to all the animal health professionals in Mafraq. Three of the 4 government veterinarians there are infected. They sometimes see orchitis/epididymitis in rams/bucks and they advise the farmers to slaughter and eat or sell for meat. There is concern about sexual transmission from buck/ram to the female. Regarding the Rev-1 vaccine there is concern from many farmers about this vaccine causing abortion or poor milk quality, consequently it may be that many farmers, when given the vaccine, might just discard it.



Comments: According to the literature, Dr. Arenas said that if Rev-1 is given to pregnant animals, 70% will abort. In Algeria they give the vaccine in the conjunctiva, 1×10^9 (JOVAC). In Jordan the vaccine is given SC, at 1×10^5 (JOVAC). The reasons for the different application in Jordan relate to a study and a program led by GTZ, and there is a belief that the lower dose SC will not cause abortion. There was a call to the Ministry of Agriculture in Jordan to reconsider the vaccination program for brucellosis.

Diagnosis of abortive diseases using immunohistochemistry, in Jordan, Dr. Shereen Khoulouf and Dr. Nabil Hailat, JUST

A large number of abortion cases were examined by: histopathology, immunohistochemistry, and PCR. There was often poor correlation among the techniques as to the definitive etiology. Conclusions are that histopathology is not sufficiently different among the various etiologies to be truly useful. Also, PCR may be too sensitive, providing a positive result without sufficient evidence of the etiology actually causing damage. It is felt that immunohistochemistry provides the best tool – actually identifying large amounts of antigen within the tissue and seeing the histologic damage associated with the presence of the agent. This allows fast and accurate diseases diagnosis and thus reduce the use of antibiotics, and antibiotics resistance in both human and animals.

Tuesday, March 13

Session 3: Abortion Reports – From the Region

Chair: Dr. Mehdi Kouadria (Algeria); Co-chair: Dr. Assia Boumezag (Algeria).

Risk-based strategy for controlling ovine abortive chlamydiosis, Dr. Aymen Mamlouk, Professor of Microbiology, Tunisia

Dr. Mamlouk used a number of parameters and risk factors and assembled all into a logistic regression model for chlamydia abortions. Then using uncertainties in the various parameters, he used a Monte Carlo simulation method to determine true risk. He ranked the risks in order of importance: exchange of breeders between flocks; post-abortion care (disinfection and isolation), and serologic testing prior to flock introduction. He showed how attention to these three risk factors, perhaps done through policy programs, or general biosecurity measures, could reduce the incidence of chlamydia abortions from 32% to 0.5%. All agreed that this information could be very helpful for policy makers.



Small ruminant abortions in Algeria, Dr. Hemida Houari, Tiaret University, Algeria

Algeria's livestock population is 350,000 camels, 2M cattle, 29M sheep, and 5M goats.

- ✓ Brucella is a major concern and the country vaccinates all sheep and goats with Rev-1, one dose (ocular), in the first year of life. In 2006, the prevalence in sheep and goats was 30% and now it is 0.4%. This vaccine campaign has greatly decreased the incidence of human brucellosis. Cattle are screened annually and if positive, they are sent to slaughter.
- ✓ There is no vaccine used for chlamydia. A survey done in 2014 showed a prevalence of 24.5%. PCR testing of placenta and fetal organs showed that 50% of placentas and 60% of fetuses were positive. In the fetus, brain and eye were most rewarding for PCR.
- ✓ For Q fever, the overall sheep seroprevalence is 28%. Examining aborting ewes, 31% are seropositive.
- ✓ In general, veterinarians do not take samples from abortions in Algeria and so the lab gets very few specimens.

Sheep and goat abortions in Turkey, Dr. Irgan Daskiran, MoA, Turkey

There is a variety of sheep and goat breeds in the country. Small ruminants are an important source of red meat, and need to be increased in number to supply the in-country demand. There is now concern about brucellosis as the seroprevalence is steadily increasing. Seropositivity among humans is 2-6%. It is difficult for government officials to enter the areas near the Syrian border as there are security concerns. There is a vaccination program, farmers must enroll in the program, but they also have to pay for the vaccine. The influx of refugees from Syria has further complicated control measures. Damascus goat is a highly prized breed, and Syrian traders have taken advantage of the porous borders, bringing these valuable animals in and distributing them.

Session 4: Neonatal Death, Diarrhea in Neonates

Chair: Dr. Hemida Houari; Co-chair: Dr. Corrie Brown

Cryptosporidiosis in Jordan, Dr. Rami Mukbel, JUST

Dr. Mukbel is involved in typing and subtyping of cryptosporidia in humans and animals in Jordan. In humans, 95% of cases are due to *C. parvum* and *C. hominis*. Probably the main source of transmission to humans is in the drinking water, and most human cases are presumably anthropogenic. It is a common disease presentation in young animals and there is no effective treatment and no vaccine. Reliance is on the young animal's immune system gearing up to keep it in check. Examining fecal samples from animals, the overall infection rate is quite high, around 23%, creating significant availability of organisms in the environment for newborns.



Cryptosporidiosis, Clinical Perspective, Dr. Zaid Abbas, MS Student from Iraq, JUST



Cryptosporidium has both sexual and asexual cycles. As few as 2-10 oocysts can initiate an infection. As immunity develops, there is decreased formation of Type I merozoites and so the infection load decreases.



Biosecurity and biosafety – a glance – Dr. Ruba Omari, NCARE

Biosafety is to protect the personnel and biosecurity is to protect the population and to protect against misuse. For accurate biorisk assessment, there are three major questions:

1. What can happen?
2. What is the chance that it will happen?

3. If it happens, what are the consequences?

There are excellent guidelines that can be found in many references – the OIE Terrestrial Code, as well as in WHO and CDC materials, all available on-line.

Neonatal Deaths – Dr. Mehdi Kouadria, MoA, Algeria



In Algeria, lamb mortality (fetal loss or newborn death) is estimated at 20-25% annually. Causes are multiple and include both infectious diseases and husbandry problems. In many areas, losses can be high due to weather – it is important to keep the newborn warm.

Fattening lamb programs in Jordan, historical overview – Dr. Ahmed Deshek

Dr. Ahmed was involved in the establishment of fattening lamb programs in Jordan in the 1990's. He reviewed the development of the program and the continuing possibilities for enhancing production and offtake. He presented the obstacles that he faced and what plans he put to overcome these problems. His presentation was extremely very long and full with very important information to share with field veterinarians and with the farmers.

Pen-side tests for rotavirus, coronavirus, E coli 99 – Dr. Shukri Al-Ammodi, Zahran Drug Store

A new lateral-flow test is available for some key calf diarrhea pathogens. It will detect the pathogens and if they are a consistent problem, the farmer can incorporate vaccination with “rotavec corona” vaccine into his repertoire, one injection 12-3 weeks before calving. Also, there is a product that can be used to help decrease problems with cryptosporidium – Halocur. It must be given to each individual animal but it is very acidic and needs to be given right after suckling.



Awarding of certificates and closing remarks.

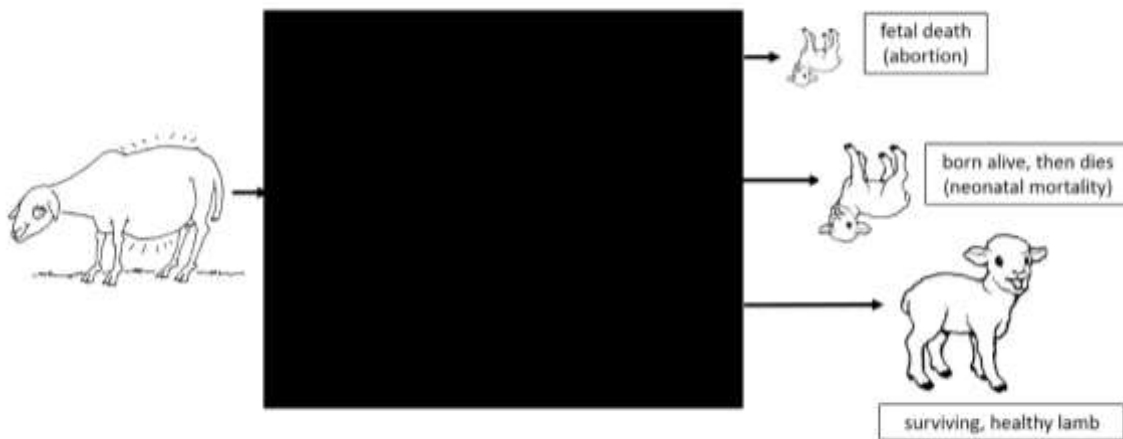
Wrap-up Session:

Corrie asked each participant to write down their answer to the following questions:

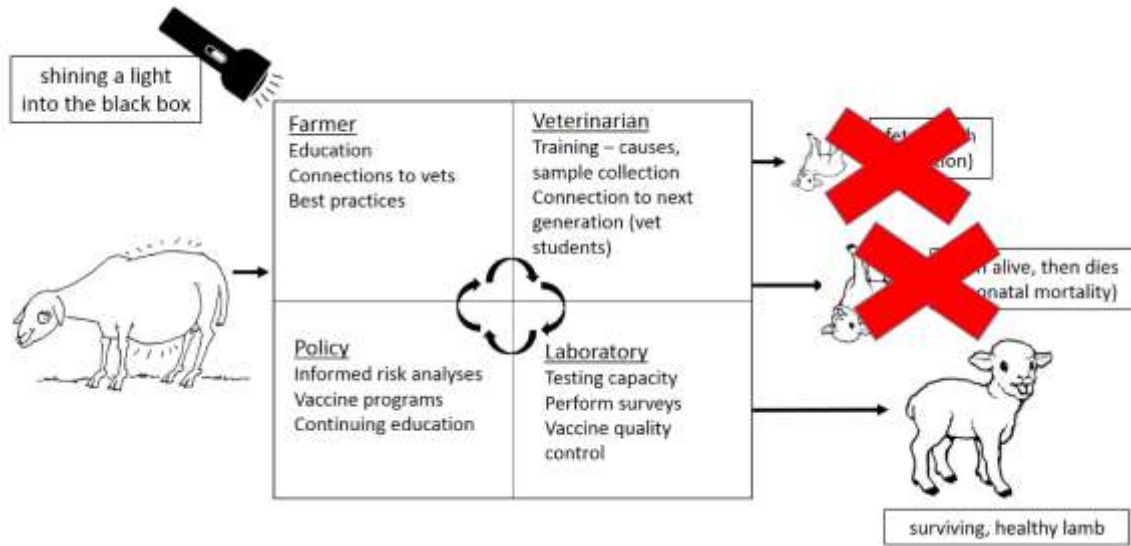
1. What are the knowledge gaps remaining regarding how to decrease abortions and neonatal mortality?
 - We don't know the causes of abortion and diagnosis so it is challenging to control
 - We need better awareness in the field so that samples are submitted
 - Are the vaccines we are using sufficiently efficacious? Are they justified?

2. What are the tools we have now to help fill the knowledge gaps?
 - Human resources and intelligence
 - Risk analysis and training for this
 - Better diagnostics to enable diagnosis
 - Good communications (phones, internet)
 - Opportunity to create best practices

Then we posted a “black box” of abortion and neonatal mortality and discussed how we have illuminated various parts of the black box through the two-day session.



The outcome of pregnancy is 3-fold. There can be death of the fetus, resulting in either absorption (very early death) or abortion (expulsion of the fetus prior to the period of viability). A second outcome is that the fetus is born alive but dies soon after (neonatal mortality). These two causes combined contribute to a huge amount of animal loss annually in the MENA region. To try to decrease abortion and neonatal mortality, it requires examining the inner workings of the “black box” and working with the entire team involved in animal health. Our workshop helped to “shine a light” onto each part of this team within the black box and create a continuous quality circle, that connects all these sectors and promotes practices, diagnostics, and policy that will allow for much higher output in terms of surviving, healthy lambs.



By examining all the members of the team, and determining what could be done to inform and improve, and by connecting all through continuous communications, it will be possible to expand the output of surviving, healthy lambs.

As a last activity of the workshop, participants were asked what they might do as their first effort when they return home, to help solve this problem, the responses were as follows:

- ✓ Establish a program to help determine etiologies of abortions/neonatal mortalities
- ✓ Work with farmers to establish best practices
- ✓ Begin risk analysis studies to inform policy makers
- ✓ Train field veterinarians on sample collection

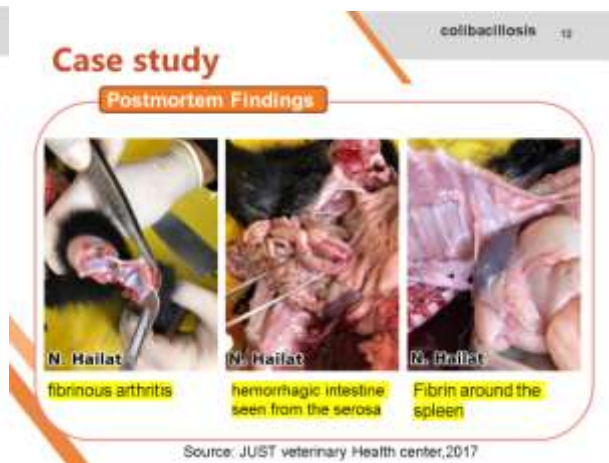
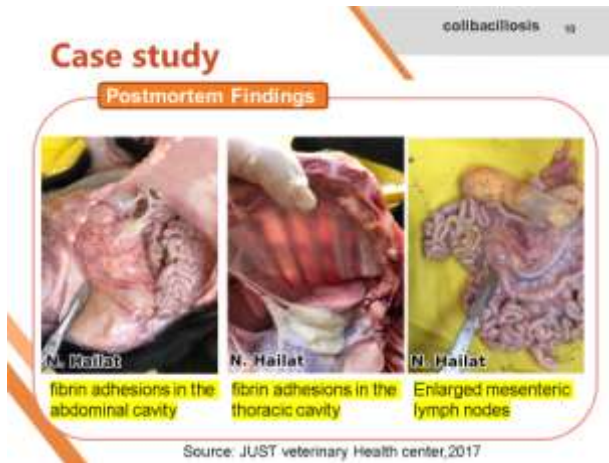
Wednesday, March 14:

Two morning presentations:

These two presentations were farmers complain of lamb's losses and were presented to the Veterinary Health Center for help and disease diagnosis. The history, mortalities and morbidities, clinical signs, gross and histopathological finds in addition to cultures and special stains were presented. Some video tapes showing the clinical presentation of the cases were also shown.



One presentation was about Enterotoxemia and the other one was about Colibacillosis. Treatment and prevention and control of these two diseases were discussed and shared with the farmers.



Closing discussion was performed and roadmap for future activities were made. Certificates were given to the participants; students, veterinarians and speakers (part of this is shown below).





Tuesday, March 13



Appendix A. Agenda

Agenda



Enhancing the Practical Diagnostic Capacities and Increased Awareness of a Group of Abortive Diseases and Neonatal Deaths in Small Ruminants and Cattle, in the MENA Region

Jordan University of Science and Technology

Irbid, Jordan

12-14th of March, 2018

Coordinator and PI of the Regional Workshop: Nabil Hailat, DVM, Ph.D., JUST

Monday, March 12th

TIME	ACTIVITY	SPEAKER
9:00-9:30	Registration	
9:30-10:00	Opening Ceremony – 6 welcoming speeches, 5 minutes each	Director of the Consultation Center, JUST Representative of Tunisia Dean of Tiaret University, Algeria Representative of Turkey Dr. Mohammad Ajlouni, AARINENA Dean of the Faculty of Veterinary Medicine, JUST
10:00-10:30	Coffee and Tea break	
Session 1: Abortions – Overviews and International Perspectives		
Chair: Prof Tammi;		Co-chair: Dr. Irfan
10:30-10:50	An overview of animal health problems in Jordan: Strategy and plans	Dr. Mahmoud Hanatleh, CVO, MoA, Jordan
10:50-11:00	Perspectives from the Farming Community	Sheep and Goat Producers
11:00-11:30	Overview and pathogenesis of fetal loss, small ruminants	Dr. Corrie Brown, U of Georgia, USA
11:30-12:00	Strengthening brucellosis surveillance, diagnosis, and control in Jordan	Dr. Ekhlal Hailat, Zoonotic Project Manager, EMPHNET

12:00-12:30	Brucellosis in small ruminant abortions – Diagnostic Testing	Dr. Angela Arenas, Texas A&M University, USA
12:30-1:00	Bovine/ Ovine/ Camelid Abortion Kit	Dr. Abdelsalam Talafha, JUST
01:00-02:00	Lunch, University Restaurant	
<i>Session 2: Abortions – Overviews and International Perspectives</i>		
Chair: Dr. Angela		Co-chair: Dr. Mamlouk
02:00-02:30	Toxoplasma as a zoonotic disease	Dr. Tammi, Texas A&M University, USA
02:30-03:00	Toxoplasmosis as a cause of abortion in Jordan	Dr. Abudalbouh, MoA, JUST
03:00-03:15	Perspectives from the Farming Community	Sheep and Goat Producers
03:15-04:00	Diagnosis of abortive diseases using immunohistochemistry, in Jordan	Dr. Shereen Khlouf and Dr. Nabil Hailat, JUST
4:00 – 04:15	Wrap-up and Discussion	
7:00	Group Dinner	

Tuesday, March 13

TIME	ACTIVITY	PERSON RESPONSIBLE
<i>Session 3: Abortion Reports from the Region</i>		
Chair: Dr. Kouadria		Co-Chair: Dr. Angela
9:00-9:30	Risk-based strategy for controlling ovine abortive chlamydia	Dr. Aymen Mamlouk, University of Manouba, Tunisia
9:30-10:00	Small ruminant abortions in Algeria	Dr. Houari Hemida, Tiaret University, Algeria
10:00-10:30	Sheep and goat abortions in Turkey	Dr. Irfan Daskiran, Turkey
10:30-10:45	Summary of key points presented, specific to ABORTIONS, plus Farmers' Perspectives	
10:45-11:00	Coffee Break	
<i>Session 5: Diarrhea in Neonates</i>		
Chair: Dr. Hemida		Co-Chair: Dr. Corrie
11:00-11:40	Cryptosporidiosis in Jordan Cryptosporidiosis – clinical perspective	Dr. Rami Mukbel, JUST Dr. Zaid Abbas, JUST
11:40-12:00	Brief overview of biosecurity, biosafety	Dr. Ruba Omari, NCARE
12:00-1:00	Lunch, University Restaurant	
<i>Session 6: Diarrhea in Neonates, cont.</i>		
Chair: Dr. Hemida		Co-Chair: Dr. Corrie

1:00-1:30	Neonatal diarrheas – An overview	Dr. Mehdi Kouadria, MoA, Algeria
1:30-1:45	Practical – Diagnosis of neonatal diarrhea	Dr. Shukri Al-Ammodi, Zahran Drug Store
1:45-2:15	Factors influencing Awassi lamb mortality under field conditions	Dr. Anas Abdelqader, U of Jordan
2:15-3:00	Challenges, problems, and opportunities in Sheep Fattening in Jordan	Dr. Ahmed Deshek, Former Consultant, Prime Minister’s Office
3:30	Bus back to Hotel	
6:00-8:00	Dinner, in Yarmouk University Street	

Wednesday 14th, 2018.

9:30-10:00	Colibacillosis Mechanisms of Diarrhea Rota and Coronaviruses	Motassem Qadora, Gaza Tamem Gharabeh, JUST
10:00-10:30	Enterotoxemia and coccidiosis	Kame Zagloul, Palestinian Authority, and Aws Batineh
10:30-11:00	Discussion and Wrap Up, Path Forward	
11:00-11:30	Certificates	
12:00-1:30	Lunch	
3:00	Bus back to Hotel	
	All the Wednesday activities were transferred to Tuesday as some of the participants had to leave on Wednesday morning.	
	Dinner, in Yarmouk University Street	





Appendix B. List of participants

List of participants

"Abortions and neonatal deaths in sheep and goats in the MENA region "

12-13th march 2018

JUST-JORDAN

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Dr. Rami Mukbel	JUST		
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Dr. KameL Zaqloul	Palestine- Authority		
Dr. Abuheja fatemah	Researcher Pharmaceutical company-Dadvet		
Dr. Aws batinah	JUST		
Dr. Tamim Gareibeh	JUST		