

WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted : 26 avril 2023 12:02

Laboratory Information

Name of disease (or topic) for which you are a designated WOA Reference Laboratory:	Brucella abortus and Brucella melitensis
Address of laboratory:	Department of Brucellosis Research - Animal Health Research Institute - Agricultural Research Center - Ministry of Agriculture and Land Reclamation: 7 Nadi El-Said Street P.O. Box 12618 Dokki Giza EGYPT
Tel.:	+201 222.28.14.76
E-mail address:	merhamdy@ahri.gov.eg - merhamdy@hotmail.com
Website:	www.ahri.gov.eg
Name (including Title) of Head of Laboratory (Responsible Official):	Dr. Momataz A. Shahein Director: Animal Health Research Institute (AHRI), (ARC) Egypt
Name (including Title and Position) of WOA Reference Expert:	Dr. Mahmoud E. R. Hamdy Chief Researcher, Depart. of Brucellosis Research, Animal Health Research Institute (AHRI) Dokki, (ARC) Egypt.t
Which of the following defines your laboratory? Check all that apply:	Governmental

TOR1: DIAGNOSTIC METHODS

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in WOA Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
RBT	Yes	978	0
BAPAT	Yes	978	0

CFT	Yes	628	0
c-ELISA	Yes	628	0
MRT	Yes	130	0
SAT	Yes	390	0
i-ELISA (serum)	Yes	458	0
i-ELISA (milk)	Yes	130	0
Rivanol T	No	720	0
Direct diagnostic tests		Nationally	Internationally
Isolation and Identification	Yes	136	0
Biotyping	Yes	88	0
Multiplex PCR	Yes	65	0

TOR2: REFERENCE MATERIAL

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOA?H?

Yes

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TESTING	PRODUCED/ IMPORTED	QUANTITY SUPPLIED NATIONWIDE (ML, MG)	QUANTITY SUPPLIED AT INTERNATIONAL LEVEL (ML, MG)	NAME OF BENEFICIARY WOA?H MEMBER COUNTRIES
CFT Antigen - Serum agglutination antigen - Milk Ring Antigen - Buffered Agg. antigen	CFT - SAT - MRT - RBT	Imported	10-100mL	10-100mL	EGYPT

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOA?H Members?

No

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOA?H Members?

No

TOR3: NEW PROCEDURES

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?

Yes

7. Did your laboratory validate diagnostic methods according to WOA?H Standards for the designated pathogen or disease?

Yes

NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
	1- First seroprevalence and molecular identification report of Brucella canis among dogs in the Greater Cairo region and Damietta Governorate

Detection of Brucella DNA in serum of infected animals.

of Egypt (in press). 2- E.R. Hamdy, M., H. Abdel Haleem, M., K. Al-kholi, M., S. Hazem, S. (2017). 'Diagnostic Efficiency of Different Serological Tests and Real-time PCR for Detecting Brucella Infection in Camels' Sera', Journal of Veterinary Medical Research, 24(1), pp. 132-146. doi: 10.21608/jvmr.2017.43274

8. Did your laboratory develop new vaccines for the designated pathogen or disease?

No

9. Did your laboratory validate vaccines according to WOAHS Standards for the designated pathogen or disease?

No

TOR4: DIAGNOSTIC TESTING FACILITIES

10. Did your laboratory carry out diagnostic testing for other WOAHS Members?

No

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAHS Member?

Yes

NAME OF THE WOAHS MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED
PAKISTAN	Consultation on new vaccine validation according to WOAHS Standards	Electronic, through emails.
ALGERIA	consultation on production of Rose Bengal Antigen	Through email and through voice record
SUDAN	Consultation on preservation of Viable Brucella strains and standard biotyping methods	Through internet connection
GERMANY	Consultation with WOAHS Ref Lab in Germany concerning Isolation of Brucella suis bv2 for the first time in Egypt and outside Europe	Through internet connection by emails. and phone calling
SPAIN	consultation with Ref Lab in Spain for Analysis of Egyptian B. melitensis strains by MALVA 16 and Bruce-Ladder PCR.	through internet, emails.

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

12. Did your laboratory participate in international scientific studies in collaboration with WOAHS Members other than the own?

Yes

Title of the study	Duration	PURPOSE OF THE STUDY	PARTNERS (INSTITUTIONS)	WOAHS MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY
Tracking the distribution, genetic diversity and		To track the history of distribution of B. melitensis in Egypt and to	FLI, WOAHS Ref Lab for Brucellosis. University of Hohenheim, Institute of	

Lineage of Brucella melitensis recovered from humans and animals in Egypt based on core genome SNP analysis and insilico MLVA16.	3 years	trace back the sources of infection and the relatedness of Egyptian B. melitensis strains with other strains distributed in other countries.	Animal Science, Dept. of Livestock Infectiology and Environmental Hygiene, Germany. University of Tuebingen, IT Center (ZDV), Germany.	GERMANY
Whole-genome sequencing (WGS) analysis of Brucella suis biovar 2 isolated from domestic pigs in Egypt for epidemiological and genetic diversity tracing	2 years	In this study, 14 Brucella suis biovar 2 (B. suis bv 2) strains isolated from slaughter pigs in Cairo were sequenced using Illumina technology to investigate genetic diversity, antimicrobial resistance (AMR) genes, and virulence-associated determinants. These strains were the first B. suis bv 2 isolates from Egypt.	FLI, WOA Ref Lab for Brucellosis. University of Hohenheim, Institute of Animal Science, Dept. of Livestock Infectiology and Environmental Hygiene, Germany. University of Tuebingen, IT Center (ZDV), Germany.	GERMANY
Trans-species transmission of Brucellae among ruminants hampering brucellosis control efforts in Egypt	2 years	Trans-species transmission of Brucellae among ruminants hampering brucellosis control efforts in Egypt	Centro VISAVET, Universidad Complutense de Madrid, Spain.	SPAIN

TOR6: EPIZOOLOGICAL DATA

14. Did your Laboratory collect epidemiological data relevant to international disease control?

Yes

IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:

- 1-Recent Data on Brucella canis in dogs in Egypt for the first time.
- 2- First data on isolation of B. suis bv 2 from domestic pigs in Egypt. and first record of detection of this biovar outside European continent.
- 3- Differentiation of B. melitensis isolated from sheep, goats, and humans using MALVA 16 and core genome sequencing.

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?

Yes

IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:

- 1- First sero-prevalence and molecular identification report of Brucella canis among dogs in Greater Cairo region and Damietta Governorate of Egypt
- 2-Whole-genome sequencing (WGS) analysis of Brucella suis biovar 2 isolated from domestic pigs in Egypt for epidemiological and genetic diversity tracing.
- 3- Tracking the distribution, genetic diversity and Lineage of Brucella melitensis recovered from humans and animals in Egypt based on core genome SNP analysis and insilico MLVA16.

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

7 Research articles published in peer-reviewed journals

1- Hegazy YM, Abdel-Hamid NH, Eldehieh M, Oreiby AF, Algabbary MH, Hamdy MER, Beleta EI, Martínez I, Shahein MA, García N, Eltholth M. Trans-species transmission of *Brucellae* among ruminants hampering brucellosis control efforts in Egypt. *J Appl Microbiol.* 2022 Jan;132(1):90-100.

doi: 10.1111/jam.15173. Epub 2021 Jul 6. PMID: 34091986

2- Holzer, K., Wareth, G., El-Diasty, M., Abdel Hamid, N.H., Hamdy, M.E.R., Moustafa, S.A., Linde, J., Bartusch, F., Abdel Glil, M.Y., Sayour, A.E., Elbauomy, E.M., Elhadidy, M., Melzer, F., & Beyer, W. (2022). Tracking the distribution, genetic diversity and Lineage of *Brucella melitensis* recovered from humans and animals in Egypt based on core genome SNP analysis and insilico MLVA 16. *Transboundary and Emerging Diseases*, 1–12. <https://doi.org/10.1111/tbed.14768>

3- Abel-Hamid NH, Elmonir W, Beleta EIM, Ismail RI, Shahein M, Hamdy MER (2022). Assessment of pcr-based dna fingerprinting techniques as a novel approach for genotyping of brucella strains in egypt. *Adv. Anim. Vet. Sci.* 10(6):12801288.DOI | <http://dx.doi.org/10.17582/journal.aavs/2022/10.6.1280.1288>.

4- Wareth, G., Dadar, M., Ali, H., Hamdy, M.E.R., Al-Talhy, A.M., Elkharsawi, A.R., Abdel-Tawab, A.A., Neubauer, H., 2022. The perspective of antibiotic therapeutic challenges of brucellosis in the Middle East and North African countries: Current situation and therapeutic management. *Transboundary and Emerging Diseases* 10.1111/tbed.14502.El-Husseini, D.M.; Sayour, A.E.; Melzer, F.; Mohamed, M.F.; Neubauer, H.; Tammam, R.H. Generation and Selection of Specific Aptamers Targeting *Brucella* Species through an Enhanced Cell-SELEX Methodology. *Int. J. Mol. Sci.* 2022, 23, 6131. <https://doi.org/10.3390/ijms23116131>

5- Elmonir, W., Abdel-Hamid, N.H., Hamdy, M.E.R. Eman I. M. Beleta, Mohamed El-Diasty, Falk Melzer, Gamal Wareth & Heinrich Neubauer . Isolation and molecular confirmation of *Brucella suis* biovar 2 from slaughtered pigs: an unanticipated biovar from domestic pigs in Egypt. *BMC Vet Res* 18, 224 (2022). <https://doi.org/10.1186/s12917-022-03332-2>.

6- Wareth, G., Abdel-Hamid, N. H., Hamdy, M. E., Elmonir, W., Beleta, E. I., El-Diasty, M., Abdel-Glil, M. Y., Melzer, F., & Neubauer, H. (2023). Whole-genome sequencing (WGS) analysis of *Brucella suis* biovar 2 isolated from domestic pigs in Egypt for epidemiological and genetic diversity tracing. *Veterinary Microbiology*, 277, 109637. <https://doi.org/10.1016/j.vetmic.2022.109637>

7- Abel-Hamid NH, Elmonir W, Beleta EIM, Ismail RI, Shahein M, Hamdy MER (2022). Assessment of PCR-based DNA fingerprinting techniques as a novel approach for genotyping of *Brucella* strains in Egypt. *Adv. Anim. Vet. Sci.* 10(6): 1280-1288. DOI | <http://dx.doi.org/10.17582/journal.aavs/2022/10.6.1280.1288>

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b) International conferences:

No

c) National conferences:

Discussion of 2 Ph D Thesis and participation in 2 workshops.

1- Ph D entitled ((Epidemiological and Molecular based approach for diagnosis and control of bovine brucellosis under local conditions in Egypt.

2- INCIDENCE OF VIRULENCE GENES IN PREDOMINANT BRUCELLA STRAINS AMONG DOMESTIC ANIMALS IN EGYPT.

Workshops:

1- "Enhancing Preparedness for Deliberate Bioincidents in Egypt," hosted by Gryphon Scientific and Human Link on Saturday, December 17 from 9:00 am – 5:00 pm at Ramses Hilton, Cairo.

2- Workshop (setting strategy for the preparedness and control of Brucellosis, Avian Influenza and Rabies)) under the supervision of the

WHO Regional Office in Cairo.

d) Other (Provide website address or link to appropriate information):

provide web site for AHRI Institute with information on Brucellosis Research Department Activities

<https://www.ahri.gov.eg>

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOA Members?

No

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
ISO 17025:2017		ISO 17025 AHRI 2022.pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
CFT	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
MRT	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
RBT	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
BAPAT	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
SAT (Tube & microplate)	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
iELISA (on serum and milk	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
cELISA	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
Rivanol Test	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
Detection of Brucella	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)
Multiplex PCR	EGAC (Egyptian Accreditation Council) That Accredited by (ilac MRA)

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

Chapter 1.1.4. Biosafety and biosecurity: Standard for managing biological risk in the veterinary laboratory and animal facilities (version adopted in May 2015).

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOA?H?

No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOA?H?

No

TOR10: NETWORK WITH WOA?H REFERENCE LABORATORIES

23. Did your laboratory exchange information with other WOA?H Reference Laboratories designated for the same pathogen or disease?

Yes

24. Are you a member of a network of WOA?H Reference Laboratories designated for the same pathogen?

No

25. Did you organise or participate in inter-laboratory proficiency tests with WOA?H Reference Laboratories designated for the same pathogen?

Yes

PURPOSE OF THE PROFICIENCY TESTS: 1	ROLE OF YOUR REFERENCE LABORATORY (ORGANISER/ PARTICIPANT)	NO. PARTICIPANTS	PARTICIPATING WOA?H REF. LABS/ ORGANISING WOA?H REF. LAB.
for external quality control and accreditation according to ISO 17025 including many tests (CFT- MRT- SAT (Plate & Tube) - RBT - iELISA - cELISA- Identification of B. abortus by slide Staining - PCR - Multiplex PCR	Participant	11-23	APHA, UK.

26. Did your laboratory collaborate with other WOA?H Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOA?H REFERENCE LABORATORIES
Tracking the distribution, genetic diversity and Lineage of Brucella melitensis recovered from humans and animals in Egypt based on core genome SNP analysis and insilico MLVA16.	Brucella melitensis is the most virulent and pathogenic strain among all Brucella members. In Egypt B. melitensis infects sheep and goats (original Host), in addition to Cattle Buffaloes , Camels and Human. In this study the scope is to trace back the sources of infection and to identify the Whole Genome Sequencing if B. melitensis.	FLI, WOA?H Reference Lab for Brucellosis in Germany
Tracking the distribution, genetic diversity and lineage of Brucella melitensis recovered from humans and animals in Egypt based on	For the First time Brucella suis bv 2 isolated outside European continent, in Egypt. The research assess the probable sources of this	FLI, WOA?H Reference Lab for Brucellosis in Germany

core-genome SNP analysis and in silico
MLVA-16biovar in Egyptian domestic pigs through
WGS.**TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING**

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAHA Reference Laboratories for the same pathogen?

Yes

Purpose for inter-laboratory test comparisons ¹	Role of your reference laboratory (organizer/participant)	No. participating laboratories	Region(s) of participating WOAHA Member Countries
For the quality assurance of the CFT Test (American technique). and Rivanol Test.	Participant	44	America

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAHA?

No

29. Additional comments regarding your report:

Yes

- Although the report contains seven published researches in peer-reviewed Journals and many scientific activities and screening of Brucellosis (*B. abortus* and *B. melitensis*) on cattle Buffaloes, sheep, goats and camels, our WOAHA Ref Lab expand the scope and increases the survey of dogs and swine which were neglected species in Egypt, with an unknown situation for Brucellosis.
- The Lab set a plan to be a Proficiency Test provider for Brucellosis Serodiagnoses.
- The Lab faces difficulties with international training, The main reason for the shortage of international training is the lack of funds from participant countries to afford the costs of international travelling.