African Union

AFRICA CDC
Centres for Disease Control and Prevention
Safeguarding Africa's Health

AMR
TECHNICAL SCORECARD

VETERINARY
General Precedures

General

Version 1.1 – August 2021

IN PARTNERSHIP WITH

FIND
Diagnosis for all

ASLM
AFRICAN SOCIETY FOR LABORATORY MEDICINE

Score

Section	Sum of maximum points[1]	Current Audit Date:		Previous audit Date:	
		Current audit score		Previous audit score	
1. Documents and Records			%		%
2. Management Reviews			%		%
3. Organization and Personnel			%		%
4. Client Management and Customer Service			%		%
5. Equipment			%		%
6. Evaluation and Audits			%		%
7. Purchasing and Inventory			%		%
8. Process Control and Internal and External Quality Assessment			%		%
9. Information Management			%		%
10. Corrective Action			%		%
11. Occurrence Management and Process Improvement			%		%
12. Facilities and Safety			%		%
General Module Total			**%**		**%**
General Module Stars[2]					

[1] Total number of points of all questions minus points for questions answered with NA.
[2] No Stars: < 55%
1 Star: 55% - 64%
2 Stars: 65% - 74%
3 Stars: 75% - 84%
4 Stars: 85% - 94%
5 Stars: ≥95%

A. General Information

Name of assessor(s)			
Title & organization of assessor			
Name of laboratory being assessed			
Type of laboratory	• National • Reference • Provincial / County • District / Sub-district • Zonal • Field • Other (specify) _____	• Public • Private • Academic • NGO	
Does the microbiology laboratory meet minimum space and infrastructure requirements?			
How many farms/counties/villages are in the laboratory catchment area?			
Location of laboratory being assessed (City/Town, County / District / Sub-district and Country)			
Details of contact person at laboratory			
Name			
Position			
Qualification			
Email			
Phone			
Is there a veterinary microbiologist and/or veterinarian with experience in microbiology on staff?[3]	Y / N		
If "Y", how many years' experience do they have?			
If, "N", what is the highest qualified member of the laboratory staff?			
Is the laboratory accredited?	Y / N		
Name of accrediting body?			
What tests is the laboratory accredited for?			
Date of last assessment visit?	Date	Type	Score
Internal			
External			
Date of last AMR assessment visit			
Date of this AMR assessment visit			

[3] Someone with a primary veterinary qualification who has specialised in laboratory microbiology at post graduate level.

B. Technical Information

A. What procedures are available for the detection and/or identification of bacterial pathogens?

	Yes	No	Specify
Conventional methods (e.g., Gram stain, biochemical tests)			
Automated systems[4]			
Kit-based[5] / serological methods			
Anaerobic methods			
Molecular detection assays (commercial) (please specify)[6]			
Molecular detection assays (non-commercial) (please specify)[7]			
MALDI-TOF Mass Spectrometry (MS)			

B. What methods are available for Antimicrobial Susceptibility Tests (AST) of bacterial pathogens?

Method	Yes	No	Specify
Automated systems			
Gradient / Disk diffusion			
Etest			
Manual broth dilution			
Molecular AST assays (commercial) (please specify)[6]			
Molecular AST assays (non-commercial / in-house) (please specify)[7]			

C. Does the laboratory routinely perform AST on bacterial pathogens? If so, which methods are used for:

	Automated	Gradient/ Disk Diffusion	Etest	Manual broth dilution	Molecular AST assays (commercial)	Molecular AST assays (non-commercial / in-house)
S. aureus						
S. agalactiae						
S. uberis						
S. dysgalactiae						
C. bovis						
K. pneumoniae						
E. coli						
P. aeruginosa						
Mycoplasma spp.						
Salmonella sp.						
Enterococcus sp.						
Campylobacter sp.						

[4] E.g. Vitek, Microscan, Phoenix.
[5] E.g. BioMérieux's API identification and other similar products.
[6] E.g. Commercial molecular detection platforms for detection and AST including real-time PCR and sequencing. Equipment may include thermocyclers, electrophoresis and gel documentation systems.
[7] E.g. Non-commercial molecular detection platforms for detection and AST including real-time PCR and sequencing. Equipment may include thermocyclers, electrophoresis and gel documentation systems.

D. Is the following equipment available, and if so, is it functional, monitored, serviced and maintained?

	Available	Functional[8]	Monitored[9]	Serviced[10]	Maintained[11]
Ruler or caliper with millimeter markings					
Bunsen burner or micro-incinerator					
Wire loops for streaking					
Turbidity meter					
Microscope					
Thermometers					
Incubator (Aerobic)					
Incubator (Anaerobic)					
Incubator (CO_2)					
Refrigerator (2-8°C)					
Freezer (-20 - -80°C)					
Balance / scale					
Autoclave					
Biosafety Cabinet					
MALDI-TOF MS					
Molecular platforms					
Other equipment (please specify)					
•					
•					

NA = Not applicable

E. How does the laboratory obtain media for bacterial culture?

	Feces	Milk
Media is prepared on-site (non-commercial)		
Media is prepared off-site (non-commercial)		
Ready-made media is procured from a media supplier (commercial)		

F. Which AST interpretation standard (and version) does the laboratory use (check all that apply)?

Standard[12]	Yes	No	Version	Clinical / Surveillance
Clinical & Laboratory Standards Institute (CLSI) (https://www.clsi.org)				
Clinical & Laboratory Standards Institute (CLSI) Veterinary Standards (https://clsi.org/standards/products/veterinary-medicine/)				
European Committee on Antimicrobial Susceptibility Testing (EUCAST) (www.eucast.org/)				
Veterinary Committee on Antimicrobial Susceptibility Testing (VetCAST) (https://www.eucast.org/ast_of_veterinary_pathogens/)				
Other- please specify				

G. How does the laboratory report results?

Method	Yes	No
Electronic		
Paper		

[8] Is the equipment in working order?
[9] Is the functionality of equipment regularly checked (e.g. temperature / calibrated)?
[10] Is the equipment regularly serviced by a qualified service technician? Review equipment logbook.
[11] Is the equipment regularly maintained according to the manufacturer's recommendations (e.g. cleaning)? Review SOP and equipment logbook
[12] Determine whether the laboratory has constant access, either online or offline.

Section 1: Documents & Records

All generic requirements apply, see SLIPTA Section 1. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
1.5	G1.1	If the laboratory uses **automated methods** for organism identification and AST (e.g. MS, molecular, Vitek, Microscan, Phoenix):						3
		a) Does the documentation provide instructions for preparing the inoculum in the correct medium and at the correct density?						
		b) Does the documentation provide guidance on interpreting results generated by the software?						
		c) Does the documentation provide guidance on how to recognize unacceptable results?						
		d) Does the documentation outline what actions to take when unusual or unexpected AST results are documented from patient samples (e.g., reconfirm organism ID, reconfirm relevant QC, repeat testing, notify supervisor)?						
		e) Does the documentation describe the defined QC organisms, QC frequency and expected QC results for use with the instrument?						
1.5	G1.2	If the laboratory uses **kit-based methods** for organism identification[13]:						3
		a) Does the						

[13] E.g. BioMérieux's API identification and other similar products.

SLIPTA			NA	Y	P	N	Comments	Score
		documentation provide instructions for preparing the inoculum in the correct medium and at the correct density?						
		b) Does the documentation provide guidance on interpreting results?						
		c) Does the documentation provide guidance on how to recognize unacceptable results?						
		d) Does the documentation outline what actions to take when unusual or unexpected AST results are documented from patient samples (e.g., reconfirm organism ID, reconfirm relevant QC, repeat testing, notify supervisor)?						
		e) Does the documentation describe the defined QC organisms, QC frequency and expected QC results for each test?						
1.5	G1.3	If the laboratory uses **conventional methods** for organism identification and AST:						3
		a) Does the documentation provide instructions for preparing the inoculum in the correct medium and at the correct density?						
		b) If manual MIC methods are used, does the documentation describe specific criteria for measuring and determining the MIC endpoints?						

SLIPTA			NA	Y	P	N	Comments	Score
		c) Does the documentation describe criteria for interpretation of the endpoint or zone size?						
		d) Does the documentation provide guidance on how to recognize unacceptable results?						
		e) Does the documentation outline what actions to take when unusual or unexpected AST results are documented from patient samples (e.g., reconfirm organism ID, reconfirm relevant QC, repeat testing, notify supervisor)?						
		f) Does the documentation describe the defined QC organisms, QC frequency and expected QC results for each test?						
1.5	G1.4	Does the laboratory provide restrictive (selective or cascade) reporting of AST[14]?						2
Section 1: Documents & Records Subtotal								11

[14] In cascade reporting, antimicrobial agents of each class are ranked based on a spectrum of activity, popularity or potential for the over-prescribing risk of drug resistance and cost. Thus, the reported AST should include the most appropriate and least expensive drugs, provided the organism is susceptible. Higher risk agents are only released if alternative options are lacking. In selective reporting, the susceptibilities of broad-spectrum agents and those drugs at risk for over-prescription are deliberately withheld.

Section 2: Management Reviews

All generic requirements apply, see SLIPTA Section 2. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
2.2	G2.1	Does the laboratory have representation on all the following? • The AMR surveillance TWG • The AMR coordination committee						2
2.2	G2.2	Does the laboratory regularly report findings/trends and other related important information regarding bacterial culture and AST results to the oversight committees and the national reference laboratory?						2
2.2	G2.3	Does the laboratory report cumulative antibiogram results to oversight committees and the national reference laboratory at least annually?						2
2.2	G2.4	Do laboratory management reviews include review of feedback or recommendations from the AMR surveillance team (TWG or AMRCC for example)?						2
Section 2: Management Reviews Subtotal								8

Section 3: Organization & Personnel

Section 4: Client Management & Customer Service

All generic requirements apply, see SLIPTA Section 4. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
4.3	G4.1	Does the laboratory provide feedback to veterinarians/ farmers (directly or via oversight committees, see G2.1) regarding: • Sample quality & rejection rates • Identity & frequency of isolated or identified pathogens						2
Section 4: Client Management & Customer Service Subtotal								2

Section 5: Equipment

All generic requirements apply, see SLIPTA Section 5. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
5.3	G5.1	Does the laboratory use verified/validated methods for isolation/detection/ identification and AST of pathogens[15]?						5
5.1	G5.2	Is all equipment for isolation/ detection/identification and AST installed and placed in a suitable environment?						2
5.11	G5.3	Does the laboratory maintain all equipment for isolation/ detection/identification and AST of pathogens? (see question D)?						3
Section 5: Equipment Subtotal								10

[15] Includes all conventional, automated, kit-based, serological, MS and molecular (commercial & non-commercial) methods.

Section 6: Evaluation and Audits

All generic requirements apply, see SLIPTA Section 6. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
6.1 & 1.5	G6.1	Evaluations and audits[16]:						
		a) Do the laboratory policies require audits to be performed?						
		b) Does the laboratory regularly conduct internal audits?						
		c) Are external audits regularly conducted?						5
		d) Are audit recommendations and action plans followed up within the timeframe defined by the laboratory?						
Section 6: Evaluation and Audits Subtotal								5

Section 7: Purchasing & Inventory

All generic requirements apply, see SLIPTA Section 7. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
7.2	G7.1	Does the laboratory provide specifications for supplies and consumables and are they followed during the procurement process?						2
7.8	G7.2	Are storage areas for reagents and supplies setup, maintained and monitored according to manufacturer's requirements[17]?						2
Section 7: Purchasing & Inventory								4

[16] It is recommended that internal audits be conducted at least annually. External audits are conducted less frequently-assessors should use the recommendation of local accrediting body to determine the frequency of external audits.

[17] Ensure all supplies/reagents have not expired. Antibiotic packages not in use should be stored in a non-defrosting freezer, unopened and in their original packaging. Once opened, the antibiotic disks must be stored in such a way that the lot number and expiration date of each disk is always traceable. The antibiotic disk cartridges and strips should be stored in a tightly sealed container with active desiccants-the desiccants should be replaced or recharged at least monthly.

Section 8: Process Control

All generic requirements apply, see SLIPTA Section 8. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
SPECIMEN COLLECTION								
8.2 & 8.3	G8.1	Does the Laboratory Request Form require the date and time of sample collection to be recorded?						3
		Does the Laboratory Request Form have space for the presumptive diagnosis?						
BACTERIAL DETECTION AND/OR IDENTIFICATION								
8.8	G8.2	For automated, kit-based, molecular[18], MS or conventional methods:						3
		• Is QC performed on every new lot number/shipment of automated test reagents/ID cards/cartridges/conventional media before they are placed into use?						
		• Is the lab using inoculation medium appropriate for the procedure being performed?						
9.9 & 8.10a	G8.3	For automated methods only:						3
		• Is the instrument software up to date?						
		• Does the laboratory confirm the detection/ identification result by another method[19]?						
7.4 & 8.10a	G8.4	For kit-based methods only:						3
		• Is the manufacturer's database used for result interpretation up to date?						
		• When an ID result does not reach the acceptable threshold, is						

[18] Refer to instructions for use for commercial and non-commercial molecular identification assays.
[19] Follow-up or confirmatory testing should be performed if the software flags a questionable result and if testing is performed using a non-commercial method (or commercial method on a non-validated sample type).

SLIPTA			NA	Y	P	N	Comments	Score
		there evidence that appropriate action is taken, such as repeating the test by another method or performing additional biochemical tests?						
8.10a	G8.5	For conventional methods only: • When an identification result does not reach the acceptable threshold, is there evidence that appropriate action is taken, such as repeating the test by another method or performing additional biochemical tests?						2
BACTERIAL AST								
8.9	G8.6	For automated, kit-based, molecular[20] or conventional methods:						3
		• When performing AST, are fresh isolates (<24 hours old) used?						
		• When performing AST, are well-isolated, pure colonies (as evidenced by Gram stain, colony morphology, etc.) used?						
		• Has the lab completed a QC conversion plan for all antibiotics in use?						
		• When preparing a bacterial inoculum for AST, is a 0.5 McFarland suspension used?						
		• After inoculation, are purity plates always made from the remaining suspension?						
		• Are control organisms tested with each batch of AST performed?						
Section 8: Process Control Subtotal								17

[20] Refer to instructions for use for commercial and non-commercial molecular AST assays.

Section 9: Information Management

Section 10: Identification of Non-conformities, Corrective and Preventive Actions

All generic requirements apply, see SLIPTA Section 10. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
10.1	G10.1	Are all identified nonconforming activities documented adequately?						5
10.2	G10.2	Is root cause analysis performed and corrective action taken for all non-conforming work?						3
Section 10: Identification of Non-conformities, Corrective and Preventive Actions Subtotal								8

Section 11: Occurrence/Incident Management & Process Improvement

All generic requirements apply, see SLIPTA Section 11. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
11.4 & 11.5	G11.1	Are all reports shared periodically with veterinarians, oversight committees and the national reference laboratory (as applicable)?[21]						2
11.4 & 11.5	G11.2	Do reports for veterinarians, oversight committees and the national reference laboratory include at a minimum the number of samples, isolated or identified organisms and AST patterns?						2
Section 11: Occurrence/Incident Management & Process Improvement Subtotal								4

[21] Assessors should review the guidance documents from the AMR surveillance team (TWG or AMRCC for example) and/or veterinary services to determine the frequency that the laboratory should share its reports. If no recommendations exist, this should be at least quarterly.

Section 12: Facilities and Biosafety

All generic requirements apply, see SLIPTA Section 12. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
12.16	G12.1	Are the following PPE items used when processing samples?						2
		• Gloves						
		• Laboratory coat						
12.4	G12.2	Waste management:						2
		• Does the laboratory handle waste appropriately including disposal media and infectious material generated during testing?						
		• Are suitable disinfectants available for use when processing samples, are they freshly prepared, and is there evidence of their use[22]?						
Section 12: Facilities and Biosafety Subtotal								4

[22] Clinical Microbiology Reviews, Jan. 1999, p. 147–179

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