African Union

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

AMR
TECHNICAL SCORECARD

VETERINARY

Bacterial Culture, Detection, Identification and Antimicrobial Susceptibility Testing of Fecal Samples

Faeces

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			%		%
Feces Module Total			**%**		**%**
Feces 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			
Date, type and scope of last assessment?	Date	Type	Score
Internal			
External			
Did the last assessment include assessment of bacterial culture of feces?	Y / N		

B. Technical Information

F-A How many feces culture and molecular tests were performed last year[3,4]?

	Feces culture				Molecular[5]				Clinical diagnosis	Active surveillance
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Entire year	Entire year
Farms										
Salmonella sp.										
E. coli										
Enterococcus sp.										
Campylobacter sp.										
Other isolates (specify)										
Other isolates (specify)										
Other isolates (specify)										
Slaughterhouse										
Salmonella sp.										
E.coli										
Enterococcus sp.										
Campylobacter sp.										
Other isolates (specify)										
Other isolates (specify)										
Other isolates (specify)										
Unknown / other[6]										

[3] Refer to the World Organisation for Animal Health (OIE) for further information on OIE listed diseases and other diseases of importance: https://www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/
[4] It is highly recommended that assessors obtain the necessary permission to review the laboratory data. However, if assessors are unable to review the laboratory data this question is NOT compulsory for completion of the assessment.
[5] Molecular tests performed on feces for the detection of bacterial faecal pathogens.

	Feces culture				Molecular[5]				Clinical diagnosis	Active surveillance
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Entire year	Entire year
Salmonella sp.										
E.coli										
Enterococcus sp.										
Campylobacter sp.										
Other isolates (specify)										
Other isolates (specify)										
Other isolates (specify)										
TOTAL NUMBER OF ISOLATES										
TOTAL NUMBER OF FECES CULTURES PERFORMED										
TOTAL NUMBER OF NEGATIVE FECES CULTURES										

Q = Quarter

F-B Are there any significant variations (> 20%) in the number of bacterial feces cultures or molecular tests performed or organisms isolated each quarter? If 'Yes', please explain.

[6] If the laboratory can't distinguish between samples originating from farms or slaughterhouses, the number of organisms isolated should be recorded as "Unknown/other".

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	F1.1	Does the laboratory have documentation covering the following processes?						2
		a) Production of Salmonella Shigella (SS) Agar, Selenite F broth, MacConkey, Blood Agar, Charcoal-cefoperazone-deoxycholate agar (CCDA) or other media for fecal pathogen isolation?						
		b) Microscopic examination of feces [raw]						
		c) Processing of feces culture and molecular tests						
		d) Detection, identification and AST of fecal pathogens						
		e) Reporting of feces culture and molecular test results						
		f) Interlaboratory comparison or proficiency testing (PT)						
		g) Laboratory safety						
1.5	F1.2	Are the documents complete, in-date and witnessed by all staff performing feces culture and molecular tests[7]?						2
1.5	F1.3	Are the following processes documented?						3
		a) Rejection criteria for fecal samples[8]						
		b) How to identify						

[7] See ISO15189:2012 Clause 5.5.3 for minimum requirements for a technical Standard Operating Procedure (SOP)
[8] For more information see OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 2019 chapter 1.1.2: Collection, submission and storage of diagnostic specimens

SLIPTA			NA	Y	P	N	Comments	Score
		potential pathogens on all primary media? (SOP should describe colony appearance of potential pathogens and define how to proceed when a potential pathogen is encountered)						
		c) Instructions for referral of feces culture and molecular tests not performed at the laboratory?						
		d) Instructions for handling samples received after hours?						
		e) Instructions for referral of bacterial isolates for identification and AST?						
		f) Instructions on how to determine AST conversions for automated, disk diffusion, Etest/Gradient and microdilution AST?						
		g) Definition of rare/ unexpected AST results?						
		h) Confirmatory tests for unusual or unexpected patient AST results?						
		i) Turnaround time for feces culture or molecular tests[9]?						
Section 1: Documents & Records Subtotal								7

Section 2: Management Reviews

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[9] From sample collection to reporting

Section 3: Organization & Personnel

All generic requirements apply, see SLIPTA Section 3. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
3.6	F3.1	Is there evidence that laboratory staff have been trained in the following[10]:						3
		a) Processing of feces culture and molecular tests						
		b) Conducting and interpreting microscopic examinations						
		c) Detection/identification and AST of fecal pathogens						
		d) Interpretation of feces culture and molecular test results						
		e) Reporting of feces culture and molecular test results						
		f) QC for feces culture and molecular tests						
		g) Laboratory safety						
3.7	F3.2	Is there evidence that laboratory staff are following the procedures described in the laboratory documentation?[11]						3
		a) Processing of feces culture and molecular tests						
		b) Conducting and interpreting microscopic examinations						
		c) Interpretation of feces culture and molecular test results						
		d) Identification and AST of feces pathogens						
		e) Reporting of feces culture and molecular test results						
Section 3: Organization & Personnel Subtotal								6

[10] Review training records, competency assessment forms and duty rosters. Pay attention to date of training and scope of training compared with techniques being performed.
[11] Directly observe procedures being performed compared to the SOP.

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
4.1	F4.1	Is there evidence that the laboratory has provided clients with information/instructions on feces collection, storage and transportation to the laboratory?						3
4.1	F4.2	Is there evidence that the laboratory has provided clients with information/instructions on interpretation of feces culture and molecular test results and AST?						2
Section 4: Client Management & Customer Service Subtotal								5

Section 5: Equipment

Section 6: Evaluation and Audits

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
7.10	F7.1	Is all media for bacterial culture isolation, identification and AST stored correctly and in date (from date of manufacture media must be stored at 2-8 °C)[12]?						2
		• SS Agar (or equivalent)						
		• Selenite F broth (or equivalent)						
		• Blood Agar						
		• MacConkey Agar						
		• CCDA (or equivalent)						
		• Mueller Hinton						
Section 7: Purchasing & Inventory								2

[12] According to manufacturer's requirements.

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								
8.5	F8.1	If feces samples will reach the laboratory more than 2 hours post collection, are they transported to the laboratory on ice?						2
MEDIA QUALITY CONTROL								
8.8	F8.2	Does the laboratory perform QC testing on all media before use[13]?						
		SS (or equivalent)						
		Do QC records demonstrate that they are checked for their ability to suppress growth of *Enterobacteriaceae* while allowing the growth of *Salmonella*?						
		Selenite F broth (or equivalent)						
		Do QC records demonstrate that Selenite F is checked for ability to suppress growth of Enterobacteriaceae while allowing the growth of *Salmonella*?						
		Blood agar						3
		Do QC records for blood agar plates demonstrate that they are checked for their ability to support growth of fastidious organisms?						
		Do QC records for blood agar plates demonstrate that they are checked for their ability to show beta, alpha, and gamma haemolysis?						
		MacConkey agar						
		Do QC records for MAC plates demonstrate that they are checked for their ability to suppress growth of Gram-positive organisms while allowing the growth						

[13] This includes in-house made or purchased from commercial sources.

SLIPTA			NA	Y	P	N	Comments	Score
		of Gram-negative organisms?						
		Do QC records for MAC plates demonstrate that they are checked for their ability to allow visualization of lactose fermentation?						
		CCDA (or equivalent)						
		Do QC records for CCDA plates demonstrate that they are checked for their ability to support *Campylobacter sp.*?						
		Mueller Hinton Agar (MHA)						
		Do QC records demonstrate that MHA plates are checked for their ability to grow *S. aureus* & *E. coli*?						
8.8	F8.3	Does the laboratory:						3
		a) Perform sterility and performance tests for every batch of culture media using certified reference strains as controls?						
		b) Source their references strains from an authorized supplier (e.g. ATCC)?						
		c) Store, culture and sub-culture their reference strains in accordance with the specification from the supplier?						
8.10	F8.4	Does the laboratory determine the cause of failed QC (root cause analysis), perform corrective actions and measure their effectiveness?						2
BACTERIAL FECES CULTURE PROCEDURE								
8.7	F8.5	Does the laboratory perform a microscopic examination [wet prep & concentrated] for parasites on feces specimens?						2
8.7	F8.6	Does the laboratory recheck microscopic						2

SLIPTA			NA	Y	P	N	Comments	Score
		observations/ interpretations among all personnel performing microscopy (wet prep and concentrated)?						
8.7	F8.7	Are reference materials, such as permanent mounts, photomicrographs, NCCLS documents M15-A and M28-A2, or printed atlases available at the work bench to assist with identification of parasites?						2
8.7	F8.8	Does the laboratory perform a bacterial culture on all feces samples as per their policy?						2
8.7	F8.9	Are the following media used for primary culture of feces[14]?						2
		• SS Agar or equivalent						
		• Selenite F broth or equivalent						
		• Blood agar						
		• MacConkey agar						
		• CCDA agar or equivalent						
8.7	F8.10	Does the feces processing procedure include plating from Selenite F broth or equivalent to SS/XLD agar or equivalent?						2
8.7	F8.11	Are media used for primary culture of feces incubated at 35-37°C for at least 18 hours?						2
8.7	F8.12	Are media used for primary culture of feces incubated aerobically?						2
BACTERIAL ID & AST								
8.7	F8.13	Does the laboratory perform identification tests (ID) for at least the following enteric pathogens? • *Salmonella sp.* • *E. coli* • *Enterococcus sp.*						2

[14] Either SS agar or XLD agar or equivalent and Selenite F broth or equivalent, see user guide section 3.4.4.

SLIPTA			NA	Y	P	N	Comments	Score
		• *Campylobacter sp.*						
8.7	F8.14	Does the laboratory perform AST on at least the following enteric pathogens using an approved test method? • *Salmonella sp.* • *E. coli* • *Enterococcus sp.* • *Campylobacter sp.*						2
8.7	F8.15	Is the following testing performed for Gram negative bacteria including *Salmonella* identification: • Oxidase • Indole • Methyl Red • Voges Proskauer • Citrate • Triple Sugar Iron or Kligler Iron • Urease • Motility • *Salmonella* serology						2
8.7	F8.16	Is Gram negative bacteria AST done as per current CLSI Vet/ VetCAST guidelines for diagnostic testing and CLSI/EUCAST guidelines for surveillance testing?[15]						2
8.7	F8.17	Is the following testing performed for *Enterococcus sp.* identification? • Bacitracin • Pyrrolidonyl Arylamidase (PYR) • Bile solubility • Optochin						2
8.7	F8.18	Does *Enterococcus sp.* AST include the following antibiotics: • Oxacillin • Co-trimoxazole • Ceftriaxone or cefotaxime						2

[15] See user guide for links to CLSI, EUCAST, CLSI veterinary and VetCAST guidelines

SLIPTA			NA	Y	P	N	Comments	Score
8.7	F8.19	Is the following testing performed for *Campylobacter sp.* identification? • catalase • oxidase • hippurate hydrolysis • nitrate/nitrite reduction						2
8.7	F8.20	Does *Campylobacter sp.* AST include the following antibiotics: • erythromycin • tetracycline • ciprofloxacin						2
8.7	F8.21	Does the laboratory use Combination Disk Test or another equivalent method for Extended Spectrum Beta-Lactamase (ESBL) screening[16]?						2
8.7	F8.22	Does the laboratory use Combination Disk Test or another equivalent method for carbapenemase screening?						2
INTERLABORATORY COMPARISON, PT AND EXTERNAL QUALITY ASSURANCE (EQA)								
8.14	F8.23	Is the laboratory enrolled in an interlaboratory comparison and/or PT program for feces culture and/or molecular tests for organism identification and AST?						2
8.14	F8.24	Did the laboratory pass the last 3 rounds of interlaboratory comparison or PT program testing?						2
8.14	F8.25	Does the laboratory receive onsite supervision visits as part of the EQA program for feces culture and/or molecular tests?						2
Section 8: Process Control Subtotal								52

[16] J Clin Microbiol. 2013 Sep; 51(9): 2986–2990.

Section 9: Information Management

All generic requirements apply, see SLIPTA Section 9. In addition, assessors should review the following:

SLIPTA			NA	Y	P	N	Comments	Score
9.3	F9.1	Does the final report for feces culture list the organisms for which the specimen was and was not cultured[17]?						2
9.3	F9.2	Does the laboratory report alert organisms which include at least the following:[18] • ESBL producing organisms • Carbapenem resistant *Salmonella*						2
Section 9: Information Management Subtotal								4

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

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	F11.1	Are the following performance indicators collected[19]?						3
		• Number of feces culture and molecular tests performed (disaggregated by type):						
		○ Farms						
		○ Slaughterhouse						
		○ Unknown/ referred[20]						
		• Number and percentage of feces						

[17] The laboratory should inform the veterinarian on the report what organisms were excluded during the culture process. This may be either by choice of media or incubation conditions (e.g. anaerobic organisms). Assessors should review a number of laboratory reports to determine how results are reported. Procedures should be consistent with the laboratory's SOPs.
[18] Alert organisms are organisms with significant public health threat and / or organisms that are notifiable.
[19] It may not be possible for laboratories to determine the origin of the feces samples if this is not collected on the laboratory requisition form.
[20] If the laboratory cannot distinguish the origin of the feces samples, the number of organisms isolated should be recorded as "Unknown/referred".

SLIPTA			NA	Y	P	N	Comments	Score
		culture tests rejected, disaggregated by reason (target <1%)						
		• Number and percentage of feces culture tests where parasites were observed						
		• Number of feces culture tests where pathogens were isolated or identified, disaggregated by type:						
		○ *Salmonella sp.*						
		○ *E. coli*						
		○ *Enterococcus sp.*						
		○ *Campylobacter sp.*						
		• Feces culture and/or molecular test TAT[21], disaggregated by farm/ slaughterhouse/ unknown/referred)						
Section 11: Occurrence/Incident Management & Process Improvement Subtotal								3

Section 12: Facilities and Biosafety

[21] From sample collection to reporting.

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