

Cut-off values recommended by the EU Reference Laboratory for Antimicrobial Resistance (EURL-AR)

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Standardised cut off values are essential for comparison of antimicrobial susceptibility monitoring results. The European Committee on Antimicrobial Susceptibility Testing (EUCAST; <http://www.eucast.org/>) provides clinical breakpoints, epidemiological cut-off values and expert rules to assist microbiologists in the interpretation of antimicrobial susceptibility test (AST) results.

For the purpose of monitoring, the EURL-AR recommends the use of EUCAST epidemiological cut-off values, when available, which allow categorisation of bacteria as wildtype or non-wildtype (to simplify, the terms 'susceptible' and 'resistant' are often maintained). Accordingly, the epidemiological cut off values recommended by the EURL-AR for interpretation of AST results for *Salmonella* spp., *Campylobacter coli*, *C. jejuni*, *Escherichia coli*, *Staphylococcus aureus*, *Enterococcus faecium* and *E. faecalis* are listed in Tables 1-5 below.

ESBL producers

Bacterial isolates resistant to cephalosporins, such as cefotaxime (CTX), ceftazidime (CAZ) or ceftiofur (XNL), should be confirmed as extended-spectrum β -lactamase (ESBL)-producers by confirmatory tests. The EUCAST expert rules state that *the presence or absence of an ESBL does not in itself influence the categorization of susceptibility*.

Table 1: Guidelines for interpretation of antimicrobial susceptibility test results for *Salmonella* spp.

Antimicrobial	MIC ($\mu\text{g/mL}$) (R>)
Ampicillin (AMP)	8
Cefotaxime (CTX)	0.5
Ceftazidime (CAZ)	2
Ceftiofur (XNL)	2
Chloramphenicol (CHL)	16
Ciprofloxacin (CIP)	0.06
Colistin (COL)	2
Gentamicin (GEN)	2
Nalidixic acid (NAL)	16
Streptomycin (STR)	16
Sulfonamides (SMX)	256*
Tetracycline (TET)	8
Trimethoprim (TMP)	2

* CLSI M100 Table 2A

Table 2: Guidelines for interpretation of antimicrobial susceptibility test results for *Escherichia coli*

Antimicrobial	MIC ($\mu\text{g/mL}$) (R>)
	Ampicillin (AMP)
Cefotaxime (CTX)	0.25
Ceftazidime (CAZ)	0.5
Ceftiofur (XNL)	1
Chloramphenicol (CHL)	16
Ciprofloxacin (CIP)	0.032
Florfenicol (FFN)	16
Gentamicin (GEN)	2
Nalidixic acid (NAL)	16
Streptomycin (STR)	8*
Sulfonamides (SMX)	256**
Tetracycline (TET)	8
Trimethoprim (TMP)	2

* Based on studies performed by the EURL-AR network (manuscript accepted for publication in Microbial Drug Resistance)

** CLSI M100 Table 2A

Table 3: Guidelines for interpretation of antimicrobial susceptibility test results for *Campylobacter jejuni* and *C. coli*

Antimicrobial	MIC ($\mu\text{g/mL}$) (R>)	
	<i>C. jejuni</i>	<i>C. coli</i>
Chloramphenicol (CHL)	16	16
Ciprofloxacin (CIP)	1	1
Erythromycin (ERY)	4	16
Gentamicin (GEN)	1	2
Nalidixic acid (NAL)	16	32
Streptomycin (STR)	2	4
Tetracycline (TET)	2	2

Table 4: Guidelines for interpretation of antimicrobial susceptibility test results for *Enterococcus faecium* and *E. faecalis*

Antimicrobial	MIC ($\mu\text{g/mL}$) (R>)	
	<i>E. faecium</i>	<i>E. faecalis</i>
Ampicillin (AMP)	4	4
Chloramphenicol (CHL)	32	32
Ciprofloxacin (CIP)	4	4
Erythromycin (ERY)	4	4
Gentamicin (GEN)	32	32
Linezolid (LZD)	4	4
Streptomycin (STR)	128	512
Quinpristin-dalfopristin (Synacid) (SYN)	4*	Not applicable
Tetracycline (TET)	4	4
Vancomycin (VAN)	4	4

* DTU Food (EURL-AR), Ref.: www.danmap.org

Table 5: Guidelines for interpretation of antimicrobial susceptibility test results for *Staphylococcus aureus*

Antimicrobial	MIC ($\mu\text{g/mL}$) (R>)
Cefoxitin (FOX)	4
Chloramphenicol (CHL)	16
Ciprofloxacin (CIP)	1
Erythromycin (ERY)	1
Florfenicol (FFN)	8
Gentamicin (GEN)	2
Penicillin (PEN)	0.125*
Streptomycin (STR)	16
Sulfonamides (SMX)	128
Tetracycline (TET)	1
Trimethoprim (TMP)	2

*CLSI M100 Table 2A