



Detection Limits of Antibiotic Residue Screening Test Kits

A wide range of commercial antibiotic residue screening test methods for milk are available for use by the Australian dairy industry.

The detection limits for antibiotic residues vary between the commercial test kits. This Dairy Food Safety Note gives a summary of the detection limits for each of the antibiotic milk residue screening test kits that are currently being used in the Australian dairy industry.

Also listed in this Dairy Food Safety Note are the Australian Maximum Residue Limits (MRLs)¹ for milk antibiotic residues that correspond to those that are detected by the kits.



Photo courtesy of Copan International

References

1. Food Standard Australia New Zealand 'Food Standards Code, Volume 2, Standard 1.4.2 Maximum Residue Limits.'

Further information

Other Dairy Food Safety Notes on antibiotics and dairy food safety topics are available.

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This Dairy Food Safety Note has been produced in good faith by Dairy Food Safety Victoria. However Dairy Food Safety Victoria does not warrant the accuracy of the information or accept the responsibility of any loss due to reliance upon the information. Manufacturers are advised to contact test kit distributors for updates/changes on the detection limits listed.

Detection Limits of Antibiotic Residue Screening Test Kits

Detection Limits of the commonly used Antibiotic Test Kits and corresponding Australian Maximum Residue Limits (MRLs)

Antimicrobial	MRL (ppb)	Test Kit and Detection Limit (ppb – parts per billion)													
		Delvotest SP - NT	AIM BRT MRL	Copan	Eclipse 50	Charm II ¹	Beta-Star	SNAP ²	a	b	c	d	e	f	
Beta-lactams															
Ampicillin	10	4	2-3	2	5	4	2-5	3.5-5	3-4	3-4	8.7	3-4	3-4	nd	9.6
Amoxicillin	10	2-3	2-3	2	5	5	2-4	3.5-10	3-4	3-4	7.8	3-4	4-5	nd	7.1
Benzyl penicillin (pen G)	1.5	1-2	1.5-2	2	4	2	2-4	2-4	2-3	2-4-3	4.2	2-3	2-3	nd	4.2
Cloxacillin	10	20	10-20	12	40	30	5-10	22-41	25-35	25-35	-	20-30	20-30	nd	8.3
Dicloxacillin	-	10	5-10	5	-	20	5-10	20-30	20-30	20-30	-	20-30	20-30	nd	-
Oxacillin	-	10	5-10	5	25	30	5-10	24-90	-	-	-	-	-	nd	-
Nafcillin	-	5	5-10	4	-	30	8-20	52-111	-	-	-	-	-	nd	-
Piperacillin	-	-	5-10	-	-	-	-	-	-	-	-	-	-	nd	-
Beta-lactam Cephalosporins															
Cefacetril	-	20	-	25	-	-	-	6-13	8-18	-	-	8-18	8-18	nd	-
Cefalexin	-	50	100-200	>45	75	-	-	14-29	30-60	30-60	-	30-60	20-50	nd	-
Cefalonium/Cephalonium	20	5-10	10-15	12-15	-	-	7-15	2-3	3-5	-	-	3-5	3-5	nd	-
Ceftiofur	100	25-50	50-100	25	-	40	75-150	5-13	30-60	30-60	51	30-60	30-60	nd	72
Cefazolin	-	25	10-25	6	-	15	-	13-17	12-20	12-20	-	12-20	12-20	nd	-
Cefquinome	-	75-100	80-100	80	-	20	-	7-36	15-20	15-20	-	20-30	20-30	nd	-
Cefoperazone	-	40	20-30	30	-	-	5-8	3-7	5-9	-	-	5-9	5-9	nd	-
Cefapirin/Cephapirin	10	5	4-5	4	8	3	8-16	9-12	6-10	6-10	16	6-10	6-10	nd	18.7
Cefuroxime	100	30-80	100-200	-	-	-	-	-	3-5	-	-	3-5	3-5	nd	-
Tetracyclines															
Chlortetracycline	-	200	-	450	-	80	nd	≤100	nd	70-100	nd	nd	nd	150-300	nd
Doxycycline	-	100-150	-	150	-	-	nd	-	nd	-	nd	nd	nd	-	nd
Oxytetracycline	100	250-500	250-500	450	150	100	nd	≤50	nd	70-100	nd	nd	nd	150-300	nd
Tetracycline	100	250-500	100-200	450	150	20	nd	≤50	nd	15-30	nd	nd	nd	30-90	nd
Macrolides															
Erythromycin	40	40-80	40-60	600	400	40	nd	nd	nd	nd	nd	nd	nd	nd	nd
Pirlimycin	-	20-100	-	-	-	80	nd	nd	nd	nd	nd	nd	nd	nd	nd
Spiramycin	-	400-600	200-400	5000	-	50	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tilmicosin	25	50-100	-	75-100	-	20	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tylosin	50	30	25-50	100	100	50	nd	nd	nd	nd	nd	nd	nd	nd	nd

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Detection Limits of Antibiotic Residue Screening Test Kits

Continued Detection Limits of the commonly used Antibiotic Test Kits and corresponding Australian Maximum Residue Limits (MRLs)

Antimicrobial	Test Kit and Detection Limit (ppb – parts per billion)														
	MRL (ppb)	Delvotest SP – NT	AIM BRT MRL	Copan	Eclipse 50	Charm II ¹	Beta-Star	SNAP ²	Charm ROSA ³						
	AUS								a	b	c	d	e	f	
Sulfonamides															
Sulfanilamide	-	-	-	-	600	-	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfadimethoxine	-	100	100	50	-	4	nd	nd	nd	nd	nd	nd	nd	6.7	nd
Sulfadimidine (Sulfamethazine)	-	50-100	100-300	150	200	10	nd	nd	nd	nd	nd	nd	nd	6.2	nd
Sulfadiazine	100	25-50	100	50	-	4	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfadoxine	100	100-200	-	150	-	7	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfamerazine	-	50-100	-	60	-	4	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfamethoxazole	-	<50	-	50	-	3	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfamonomitosin	-	-	-	50	-	-	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfaquinoxaline (Sulfaquinoxazole)	-	-	-	-	-	3	nd	nd	nd	nd	nd	nd	nd	-	nd
Sulfathiazole	-	50	100	50	75	8	nd	nd	nd	nd	nd	nd	nd	-	nd
Aminoglycosides															
Dihydrostreptomycin	200	>1000	400-600	1750	-	150	nd	nd	nd	nd	nd	nd	nd	nd	nd
Gentamycin/Gentamicin	-	50	100-200	400	-	50	nd	nd	nd	nd	nd	nd	nd	nd	nd
Kanamycin	-	5000	-	4000-5000	-	-	nd	nd	nd	nd	nd	nd	nd	nd	nd
Neomycin	1500	100-200	500-750	5000-10000	800	-	nd	nd	nd	nd	nd	nd	nd	nd	nd
Spectinomycin	-	>300	-	7500	-	-	nd	nd	nd	nd	nd	nd	nd	nd	nd
Streptomycin	200	>1000	400-600	1750	-	40	nd	nd	nd	nd	nd	nd	nd	nd	nd
Others															
Chloramphenicol	-	2500	2500-5000	5000-7500	nd	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dapsone	-	0.5-1	-	2-4	nd	2	nd	nd	nd	nd	nd	nd	nd	nd	nd
Lincomycin	20	200	75-150	500-700	nd	100	nd	nd	nd	nd	nd	nd	nd	nd	nd
Novobiocin	100	1000	-	-	nd	100	nd	nd	nd	nd	nd	nd	nd	nd	nd
Thiamphenicol	-	>1000	-	>100	nd	50	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trimethoprim	50	50-100	-	135	nd	-	nd	nd	nd	nd	nd	nd	nd	nd	nd

All sensitivities are based on those declared by kit manufacturers/distributors. Australian information brochures and are current as of the date of this publication. These sensitivities correspond to when the kits are used according to the kit manufacturer/distributor instructions to give maximum sensitivities (eg; for Delvotest SP-NT – running the kit at control time).

Key

- nd - not determined, - - not specified.
- ¹ - The Charm II test sensitivities for beta-lactams and cephalosporins are for the Beta Lactam Competitive Assay test kit, macrolide sensitivities are for the tetracycline Competitive Assay, and sulfonamides are for the Sulfia Drug test kit. The Charm II Test chloramphenicol sensitivity is for the Chloramphenicol assay and each of the following antibiotics relates to a corresponding assay: dapsone – sulfia drug assay, lincomycin – macrolide assay, novobiocin – novobiocin assay and thiamphenicol – CAP/amphenicols assay. The Charm II Test aminoglycoside sensitivities listed refer to the Aminoglycoside Strep/Gent assay.
- ² - The SNAP test sensitivities for beta-lactams are for the SNAP MRL Beta-Lactam test kit, and tetracycline sensitivities are for the SNAP Tetracycline test kit.
- ³ - The following relates to the Charm Rosa kits: a-relates to MRL Beta-lactam Test, b- MRLBLU/TET™, c- SL3™, d- MRL-3, e- Sulfa & Tetracycline Test, f- SL-6.