Microbiology laboratories handling food, drink and associated samples

## **CONTENTS**

			Page no.
ì	INT	RODUCTION	i
2.	LAE	BORATORY DESIGN, SAFETY, HYGIENE AND SECURITY	2
	2.1	Laboratory facility	2
	2.2	Personnel	2
	2.3	Personal hygiene and safety	3
	2.4	Microbiological practices	4
	2.5	Control of substances hazardous to health (COSHH)	8
	2.6	Sending cultures by post	8
	2.7	Laboratory security	8
3.	LAE	BORATORY MANAGEMENT	9
	3.1	Records	9
		3.1.1 General requirements	9
		3.1.2 Electronic storage of data	10
	3.2	Traceability	10
	3.3	Laboratory quality assurance	{
		3.3.1 Laboratory accreditation	11
		3.3.2 Accreditation requirements	12
		3.3.3 The accreditation procedure	13
		3.3.4 Appraisal of laboratory performance	14
	3.4	Laboratory information management systems (LIMS)	16
	3.5	Introduction of new methods/method modifications in the laboratory	16
		3.5.1 External independent validation	17
		3.5.2 In-house evaluation	17
		3.5.3 Planning an in-house evaluation	18
4	EQUIPMENT 2		
4.	4.1	Autoclaves	21
	4.2	Automatic pipetters	22
	4.3	Automatic plate pourers	23
	4.4	Balances	23
	4.5	Centrifuges	23
	4.6	Conductivity meters	24
	4.7	Fume cupboards	24
	4.8	Glassware and other containers	24
	4.9	Gravimetric diluters	25

	4.10	Hotplates/Hotplate Stirrers	26
	4.11	Incubators	26
	4.12	Laminar airflow cabinets	27
	4.13	Media dispensers	28
	4.14	Media preparators	28
	4.15	Membrane filter units	28
	4.16	Microscopes	29
	4.17	Modified atmosphere generating systems	30
	4.18	pH meters	30
	4.19	Rapid/assisted methods	31
		4.19.1 ATP luminescence test methods	32
		4.19.2 Automated identification systems	32
		4.19.3 Automated plate counters	32
		4.19.4 Conductance/impedance equipment	33
		4.19.5 ELISA plate washers	33
		4.19.6 ELISA plate readers/spectrophotometers	34
		4.19.7 Spiral platers	34
		4.19.8 Thermal cyclers	34
		4.19.9 Others	35
	4.20	Refrigerators and freezers	35
	4.21	Safety cabinets	35
	4.22	Steamers	36
	4.23	Sterilising ovens	37
	4.24	Stomachers, pulsifiers and homogenisers	37
	4.25	Temperature monitoring devices	39
	4.26	UV lamps	40
	4.27	Water baths	40
	4.28	Water purification equipment	41
	4.29	Working temperature devices	41
5.	MED	DIA PREPARATION	43
_	5.1	Introduction	43
	5.2	Dehydrated media, supplements and chemicals	43
	5.3	Preparation and sterilisation of apparatus	43
	5.4	Water quality	44
	5.5	Reconstitution of media	44
		5.5.1 Weighing out dehydrated media and chemicals	44
		5.5.2 Mixing of powders with water	44
		5.5.3 Dissolving media prior to sterilisation	45
		5.5.3.1 Liquid media	45
		5.5.3.2 Solid media	45

	5.6	pH measurement	45
	5.7	Media dispensing	46
	5.8	Sterilisation of media	47
	5.9	Tempering of media	47
	5.10	Media supplements	48
	5.11	Storage of prepared media	48
	5.12	Precautions using stored poured plates	49
	5.13	Re-melting prepared bottled media	49
	5.14	Pouring of plates	50
	5.15	Drying of plates	50
	5.16	Media efficacy checks	51
	5.17	Reference cultures	52
	5.18	Trouble shooting guide	53
	5.19	Records	54
6.	PRO	CEDURES	56
	6. l	Sample storage and handling	56
	6.2	Sample testing procedure	56
		6.2.1 Preparation of the test sample	56
		6.2.2 Test portion and initial suspension	57
	6.3	Mixing samples	60
		6.3.1 Liquid samples	60
		6.3.2 Other samples	60
	6.4	Dilution	60
	6.5	Inoculation of solid media	62
		6.5.1 Pour plates	62
		6.5.2 Spread plates	62
	6.6	Sampling by filtration and incubation on a nutrient support	63
		6.6.1 Membranes	63
		6.6.2 Filtration procedure	63
	6.7	Diluent and media controls	64
	6.8	Streak (pre poured) plates	65
	6.9	MPN techniques	65
	6.10	Heat shock technique	66
	6.11	Incubation	66
	6.12	Colony purification	67
	6.13	Confirmation techniques	67

7.	RESULTS		68
	7.1	Counting, calculation and expression of results	68
	7.2	Most probable number methods	73
	7.3	Records of results	74
	7.4	Reporting of results	76
	7.5	Non-conforming results	77
REF	EREI	NCES	78
APPENDIX I			
Tab	le I:	Examples of equipment quality monitoring checks	82
Tabl	e 2:	Examples of rapid/assisted method equipment and quality	
		monitoring checks	87
APF	PENE	DIX 2	89
Mic	Microscopy		
APPENDIX 3			101
Exa	mple	records:	
	le I:	, , , , , , , , , , , , , , , , , , , ,	102
Tab	le 2:	An example of a record card for a medium prepared from a	
		commercially available dehydrated powder	103