Table 3b pH and survival

Substrate	pH	Acid	Temp. (°C)	D-value (h)	Death (log/2 h)	No. of strains	Ref.
TSB	4.3	HCl	30	3.3*	–	1	1
TSB	6.1	0.1 M acetate	30	11.0*	–	1	1
TSB	5.9	0.1 M formate	30	5.8*	–	1	1
TSB	5.8	0.1 M formate	30	3.8*	–	1	1
TSB	5.4	0.1 M lactate	30	1.15*	–	1	1
Skim milk	5.0	Lactic acid	30	–	2.7/2 h	1	1

* Estimated from original data

1. Wong and Chen (1988)

Table 4 Irradiation

Medium/ substrate	Temp. during irradiation (°C)	Radiation type	D-value (kGy)	Decrease (log/time)	Shoulder (kGy)	Gas phase	No. of strains (id)	Ref.
Polyvinyl chloride	RT	UV[a]	–	2–3 E/30 s*	–	Air	1 (B10)	1
High density polyethylene	RT	UV[a]	–	2–3 E/30 s*	–	Air	1 (B10)	1
Parchment paper	RT	UV[a]	–	2–3 E/30 s*	–	Air	1 (B10)	1
Distilled water	20–23	Co–60	1.6	–	2.0	Air	1 (NCTC 5893)	2
Mozzarella cheese[b]	−78	Co–60	3.6	–	–	Air	1	3
Ice cream[b]	−78	Co–60	4.1	ca. 2.0	–	Air	1	3
Yoghurt[b]	−78	Co–60	4.0	ca. 1.5	–	Air	1	3

* Approximate death rates from published data
[a] Dose, 30W UV lamp for 30 s
[b] Inoculum 10^6 spores/g

1. Patil *et al.* (1988)
2. Briggs (1966)
3. Hashisaka *et al.* (1990)

Table 5a Preservatives and toxin production

Medium	Reagent	Temp. (°C)	Toxin type	Time to formation	pH	Inoc. level** (CFU/ml)	Ref.
BHI	None	7	Diarrhoeal*	12 d	7.0	3×10^1	1
BHI	0.27% lactic acid	7	Diarrhoeal*	ND/20 d	6.0	3×10^1	1
BHI	0.16% lactic acid	7	Diarrhoeal*	ND/20 d	6.0	3×10^1	1
BHI	0.10% sorbic acid	7	Diarrhoeal*	ND/20 d	6.0	3×10^1	1

* A reversed passive latex agglutination assay of dubious specificity was used; results are questionable
** Psychrotrophic strains
ND, no death

1. van Netten *et al.* (1990)

Table 5b Preservatives

Type	Conc. (mg/kg)	Substrate	pH	Temp. (°C)	Growth (h/gen)	Death (log/time)	No. of strains	Ref.
Sorbic acid	0	Rice filling	6.6	23	2.8*	–	1	1
Sorbic acid	1000	Rice filling	NI	23	7.7*	–	1	1
Sorbic acid	2600	Rice filling	NI	23	NG	–	1	1
Sorbic acid	3800	Rice filling	<5.6	23	NG	–	1	1
Pot. sorbate	1100	Rice filling	6.6	23	5.2*	–	1	1
Pot. sorbate	3900	Rice filling	6.6	23	NG	–	1	1
BHA	0	Nutrient broth	6.8	32	0.50*	–	1	2
BHA	25	Nutrient broth	6.8	32	0.62*	–	1	2
BHA	50	Nutrient broth	6.8	32	1.0*	–	1	2
BHA	75	Nutrient broth	6.8	32	NG/8 h	ND/8 h	1	2
BHA	100	Nutrient broth	6.8	32	NG/8 h	ND/8 h	1	2
BHA	0	Cooked rice	–	32	0.64*	ND/8 h	1	2
BHA	500	Cooked rice	–	32	1.33*	ND/8 h	1	2
BHA	1000	Cooked rice	–	32	NG/24 h*	ND/1 d	1	2
BHA	5000	Cooked rice	–	32	NG/24 h*	ND/1 d	1	2
BHA	10000	Cooked rice	–	32	–	D/1 d	1	2
BHA	0	Strained chicken	–	32	0.51*	–	1	2
BHA	1000	Strained chicken	–	32	0.59*	–	1	2
BHA	5000	Strained chicken	–	32	–	D/2 d	1	2

* Approximate growth or death rates from published data
BHA, butylated hydroxyanisole
NG, no growth within 6 days
NI, not indicated
ND, not detected
D, death

1. Raevuori (1976)
2. Shelef and Liang (1982)

Table 6 Gases

Medium	Strain	Gas	Pressure	Growth (gen/h)	pH	Temp. (°C)	Ref.
Glucose-peptone–YE	1	Air[a]	0.0 atm	0.46	6.0	30	1
Glucose-peptone–YE	1	CO_2	0.5 atm	0.37	6.0	30	1
Glucose-peptone–YE	1	CO_2	1.0 atm	0.28	6.0	30	1
Glucose-peptone–YE	1	CO_2	2.0 atm	0.13	6.0	30	1
Glucose-peptone–YE	1	CO_2	3.0 atm	0.0	6.0	30	1

[a] Approx. 0.003 atm CO_2
YE, yeast extract

1. Enfors and Molin (1980)

Table 7 Disinfectants

Medium/ substrate	Strain	Reagent	Conc. (mg/kg)	Decrease (log/time)	pH	Temp. (°C)	Ref.
Polyvinyl chloride	1	H_2O_2	300,000	3 E/2 min	–	60	1
Polyvinyl chloride	1	H_2O_2	200,000	1.5 E/2 min*	–	60	1
Polyvinyl chloride	1	H_2O_2	100,000	0.5 E/2 min	–	60	1
High density polyethylene	1	H_2O_2	300,000	3 E/2 min	–	60	1
High density Polyethylene	1	H_2O_2	200,000	1 E/2 min	–	60	1
High density polyethylene	1	H_2O_2	100,000	0.5 E/2 min*	–	60	1
Parchment paper	1	H_2O_2	300,000	3 E/2 min	–	60	1
Parchment paper	1	H_2O_2	200,000	1.8 E/2 min*	–	60	1
Parchment paper	1	H_2O_2	100,000	0.5 E/2 min*	–	60	1
Polyvinyl chloride	1	NaOCl	300	2–3 E/4 min*	–	60	1
High density polyethylene	1	NaOCl	300	2–3 E/4 min*	–	60	1
Parchment paper	1	NaOCl	300	2–3 E/4 min*	–	60	1
Polyvinyl chloride	1	Formaldehyde	80,000	1.8 E/3 min*	–	NI	1
High density polyethylene	1	Formaldehyde	80,000	1.8 E/3 min*	–	NI	1
High density polyethylene	1	Formaldehyde	80,000	1.8 E/3 min*	–	NI	1
Deionized water	1 (spores)	Ozone	2.29	>6 E/5 min	–	28	2
Distilled water	1 (spores)	Iodophor	100	1 E/6 min	2.3	21	3
PO_4 buffer[a]	1 (spores)	Sodium dichloro-isocyanurate	50	1 E/1.5 min	6.5	21	3
PO_4 buffer[a]	1 (spores)	Sodium dichloroiso-cyanurate	100	1 E/5.5 min	8.0	21	3
PO_4 buffer[a]	1 (spores)	Dichlorodimethyl hydantoin	50	1 E/4.5 min	6.5	21	3
PO_4 buffer[a]	1 (spores)	Dichlorodimethyl hydantoin	100	1 E/34 min	8.0	21	3
Distilled water	1 (spores)	Iodophor	50	1 E/5 min	6.5	21	3
PO_4 buffer[a]	1 (spores)	Dibromodimethyl hydantoin	50	1 E/13.5 min	6.5	21	3
Distilled water	1 (spores)	Phenol	50,000	1 E/70 min	–	37	4
Wood	1 (spores)	Formaldehyde	50,000	3 E/45 min	–	–	5
Wood	1 (spores)	Formaldehyde	100,000	3 E/30 min	–	–	5
Wood	1 (spores)	Formaldehyde	200,000	3 E/15 min	–	–	5
Wood	1 (spores)	Peracetic acid	320	3 E/>120 min	–	–	5
Wood	1 (spores)	Peracetic acid	1250	3 E/30 min	–	–	5
PO_4 buffer[a]	1 (spores)	NaOCl	50	1 E/1.5 min	6.5	21	3
PO_4 buffer[a]	1 (spores)	NaOCl	100	1 E/2.5 min	8.0	21	3
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/0.17 min	5.2	25	6
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/0.40 min	7.0	25	6
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/1.2 min	8.0	25	6
PO_4 buffer[b]	1 (spores)	NaOCl	25	1 E/1.0 min	5.2	75	6
PO_4 buffer[b]	1 (spores)	NaOCl	75	1 E/0.08 min	5.2	75	6
PO_4 buffer[b]	1 (spores)	NaOCl	100	1 E/0.06 min	5.2	75	6
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/0.38 min	7.0	25	6
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/0.25 min	7.0	50	6
PO_4 buffer[b]	1 (spores)	NaOCl	150	1 E/0.08 min	7.0	75	6

* Approximate death rates from published data
[a] $KH_2PO_4 - K_2HPO_4 - K_3PO_4$ (0.5% solutions)
[b] 0.5 M KH_2PO_4 – 0.5 M Na_2HPO_4
NI, not indicated

1. Patil *et al.* (1988)
2. Broadwater *et al.* (1973)
3. Cousins and Allan (1967)
4. Briggs (1960)
5. Stockinger *et al.* (1989)
6. Wang *et al.* (1973)