



R & F[®] *Enterobacter sakazakii* Enrichment Broth

**A Selective Enrichment Broth That Promotes The Recovery
and Growth of Low Levels of Freeze-Injured
Enterobacter sakazakii From Foods and Environmental Sources**

Because of the low incidence of *Enterobacter sakazakii* in foods and probably most environmental sources as well, a difficulty exists in developing a reliable selective enrichment procedure that permits the proliferation of both injured and non-injured *E. sakazakii* while suppressing the growth of competing flora.

A comparison of the growth of 63 *E. sakazakii* strains in R & F[®] *Enterobacter sakazakii* Enrichment Broth (ESEB) versus growth in EE broth shows that ESEB broth supports growth of 100% of the strains, whereas at least 8% of the strains either grew poorly or failed to grow in EE broth (Table 1). Additionally, the recovery of *E. sakazakii* from environmental sponges artificially inoculated with both *E. sakazakii* and increasing levels of competing bacteria was superior in ESEB versus EE broth --particularly at the higher levels of competing bacteria (Table 2).

Table 1. Growth response of 63 strains of *Enterobacter sakazakii* in R & F® *Enterobacter sakazakii* Enrichment Broth (ESEB) and in EE broth versus growth in TSB incubated at 35°C for 24 h and pour plated on brain infusion agar

Growth response of <i>E. sakazakii</i> strains	No. of Stains (%)	
	ESEB	EE Broth
4+	54 (85.7%)	18 (28.6%)
3+	8 (12.7%)	20 (31.8%)
2+	1 (1.59%)	20 (31.8%)
1+	None	3 (4.8%)
0	None	2 (3.2%)

*Symbols: Growth responses on log₁₀ values: 4+ (0 to 0.5 log less than TSB); 3+ (between 0.5 and 1.0 logs less than TSB); 2+ (between 1.0 and 2.0 logs less than TSB); 1+ (greater than 2.0 logs less than TSB); and 0 (for no growth or death).

Table 2. Recovery comparisons of two freeze-injured strains of *Enterobacter sakazakii* artificially inoculated into sterile environmental sponges containing increasing ratios of background bacteria (*Escherichia coli*, *Citrobacter freundii*, and *Staphylococcus aureus*) to *E. sakazakii*

Strain	ESEB 24 h inc.	ESEB 48 h inc.	FDA Method	% Injury	Bkg. Ratio**
ATCC 29544	4/5*	3/5*	1/5	66.2	10:1
CDC A3 (10) 706	5/5	5/5	3/5	71.9	10:1
ATCC 29544	4/5	5/5	4/5	73.9	100:1
CDC A3 (10) 706	5/5	5/5	3/5	81.3	100:1
ATCC 29544	2/5	5/5	0/5	65.7	1000:1
CDC A3 (10) 706	4/5	5/5	1/5	67.2	1000:1

* Fractions equal number of positive plates divided by the total number of plates (R & F® *Enterobacter sakazakii* Chromogenic Plating Medium).

** Ratio is the relation between the number of background bacteria added (CFU/sponge) to a constant of 10 CFU/sponge of *E. sakazakii*.

Advantages of R & F® *Enterobacter sakazakii* Enrichment Broth

- Of 63 strains of *E. sakazakii* grown in ESEB, 98% were in the two top growth categories compared with only 60% grown in EE broth
- Permits the recovery of freeze-injured *E. sakazakii* even in the presence of high levels of competing background bacteria
- Highly selective yet supports efficient recovery from food homogenates and environmental sponges
- May be used as an enrichment broth in conjunction with subsequent culture methods or other techniques

References

1. Gurtler, J. B. and L. R. Beuchat. 2005. Performance of media for recovering stressed cells of *Enterobacter sakazakii* as determined using spiral plating and ecometric techniques. *Appl. Environ. Microbiol.* 71:7661-7669.
2. Restaino, Lawrence, Elon W. Frampton, William C. Lionberg, and Anthony Restaino. 2006. The recovery of *Enterobacter sakazakii* using a new enrichment broth. Poster No. P3-63, IAFP 2006.
3. Restaino, L., E. W. Frampton, W. C. Lionberg, and R. J. Becker. 2006. A chromogenic plating medium for the isolation and identification of *Enterobacter sakazakii* from foods, food ingredients, and environmental sources. *J. Food Prot.* 69:315-322.

ORDERING INFORMATION:

M-1200 R & F® *Enterobacter sakazakii* Enrichment Broth

M-1210 R & F® *Enterobacter sakazakii* Supplement for Enrichment Broth

M-1250 R & F® *Enterobacter sakazakii* Enrichment Broth Detection System

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