

Supplementary Information

Effects of nanobubble water on the growth of *Lactobacillus acidophilus* 1028 and its lactic acid production

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1. Medium composition

Casein peptone, tryptic digest	10.0	g
Beef extract	10.0	g
Yeast extract	5.0	g
Glucose	20.0	g
Tween 80	1.0	g
K ₂ HPO ₄	1.0	g
Sodium acetate	5.0	g
Diammonium citrate	2.0	g
MgSO ₄ ·7H ₂ O	0.2	g
MnSO ₄ ·5H ₂ O	50.0	mg
Distilled water	1.0	L
Adjust the pH to 6.5. Sterilize by autoclaving at 121 °C for 15 min.		
Add 15g agar in 1L medium to get the MRS agar medium.		

Table S1 The composition of MRS medium

The fermentation medium was the same as MRS medium except the glucose concentration was 10g/L. Casein peptone, beef extract, and yeast extract were purchased from BD Biosciences, and all the other reagents were obtained from Wako Pure Chemical Industries, Ltd.

2. The MRS medium ionic strength calculation

The ionic strength equation (Eq. (S.1)) as described elsewhere. ¹

$$I = \frac{1}{2} \sum_{i=1}^n c_i z_i^2 \quad (S.1)$$

where I (mM) is the solution ionic strength, C_i (mM) is the molar concentration of ion, Z_i the charge of the ion. The MRS medium ionic strength value was calculated equal to 177.628 mM, between the ionic strength of the 50mM CaCl_2 and 300 mM NaCl in the experiment.²

References:

1. Y. K. Yang, N. Nakada, R. Nakajima, M. Yasojima, C. Wang and H. Tanaka, *Journal of Hazardous Materials*, 2013, **244**, 582-587.
2. A. K. A. Ahmed, C. Z. Sun, L. K. Hua, Z. B. Zhang, Y. H. Zhang, T. Marhaba and W. Zhang, *Environmental Engineering Science*, 2018, **35**, 720-727.