

Supplementary Tables and Figures

Table S1. The levels of the protective agents in the CCD

Factor	Symbol	Level of factors				
		$-\alpha$	-1	0 ^a	1	α
Skim milk (%)	A	1.6	5	10	15	18.4
Maltose (%)	B	1.6	5	10	15	18.4
Maltitol (%)	C	1.6	5	10	15	18.4

a, Central point

α , 1.68

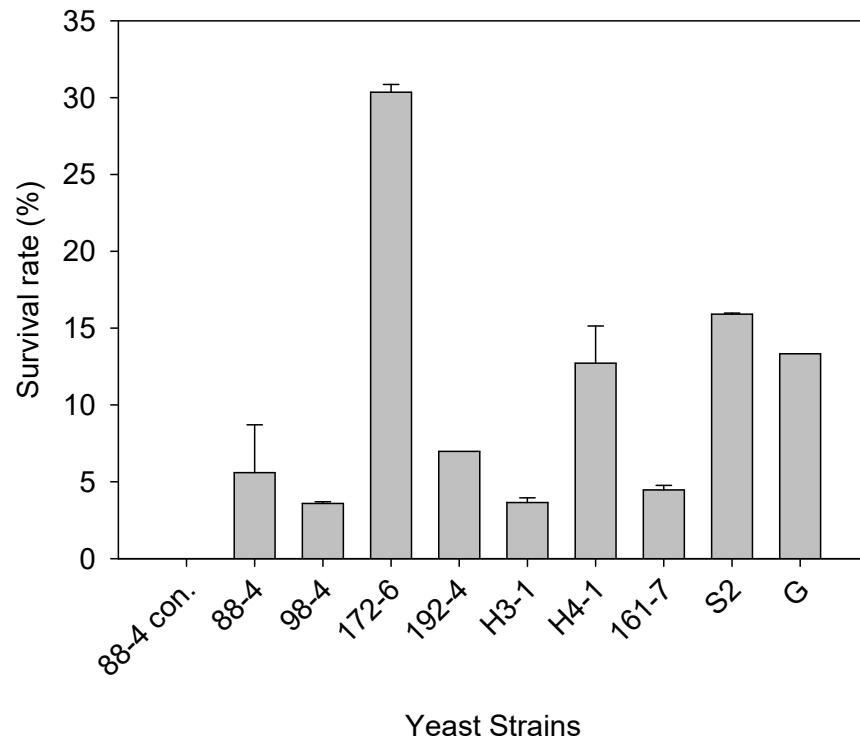


Figure S1. Survival rate of seven yeasts isolated from *nuruk* and two industrial distillery yeasts after freeze-drying

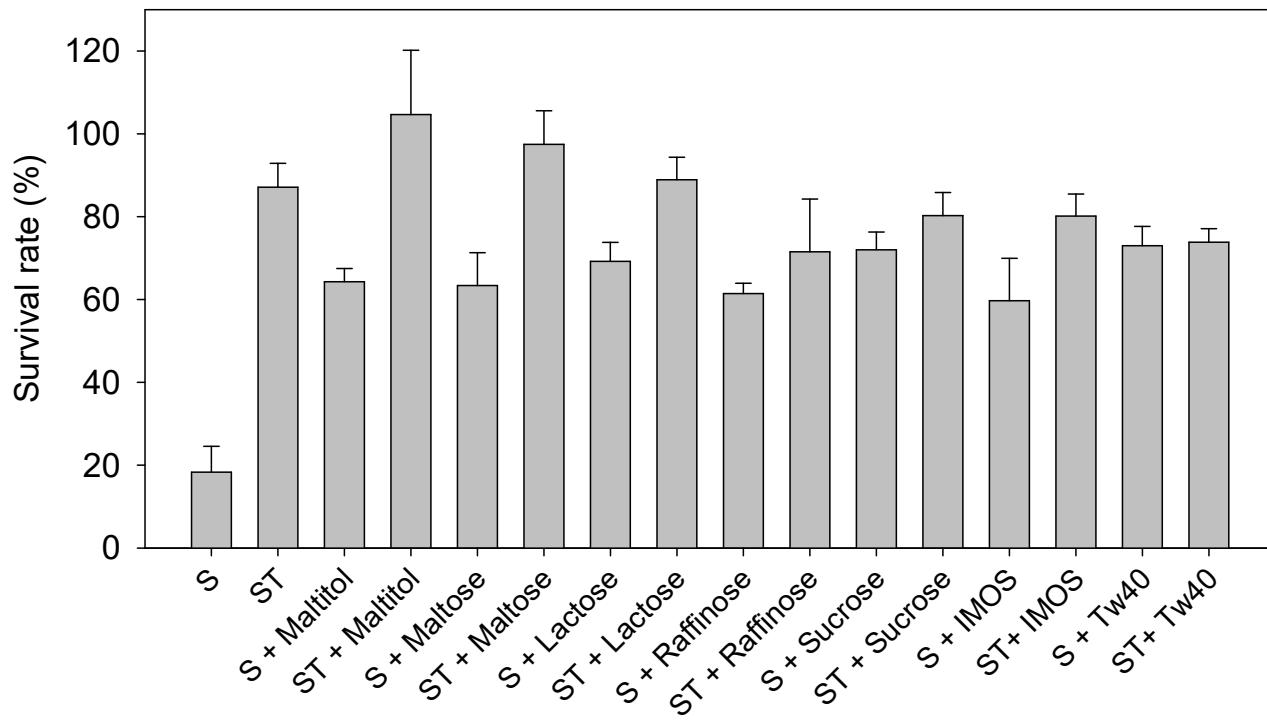


Figure S2. Comparison of protective effects of various protectant combinations on survival rate of *S. cerevisiae* 88-4 after freeze-drying; S, skim milk (15%); ST, skim milk (15%) / trehalose (10%); IMOS, isomaltooligosaccharide (1%); Tw40, Tween 40 (1%). Concentration of the protectants is listed in Table S1.

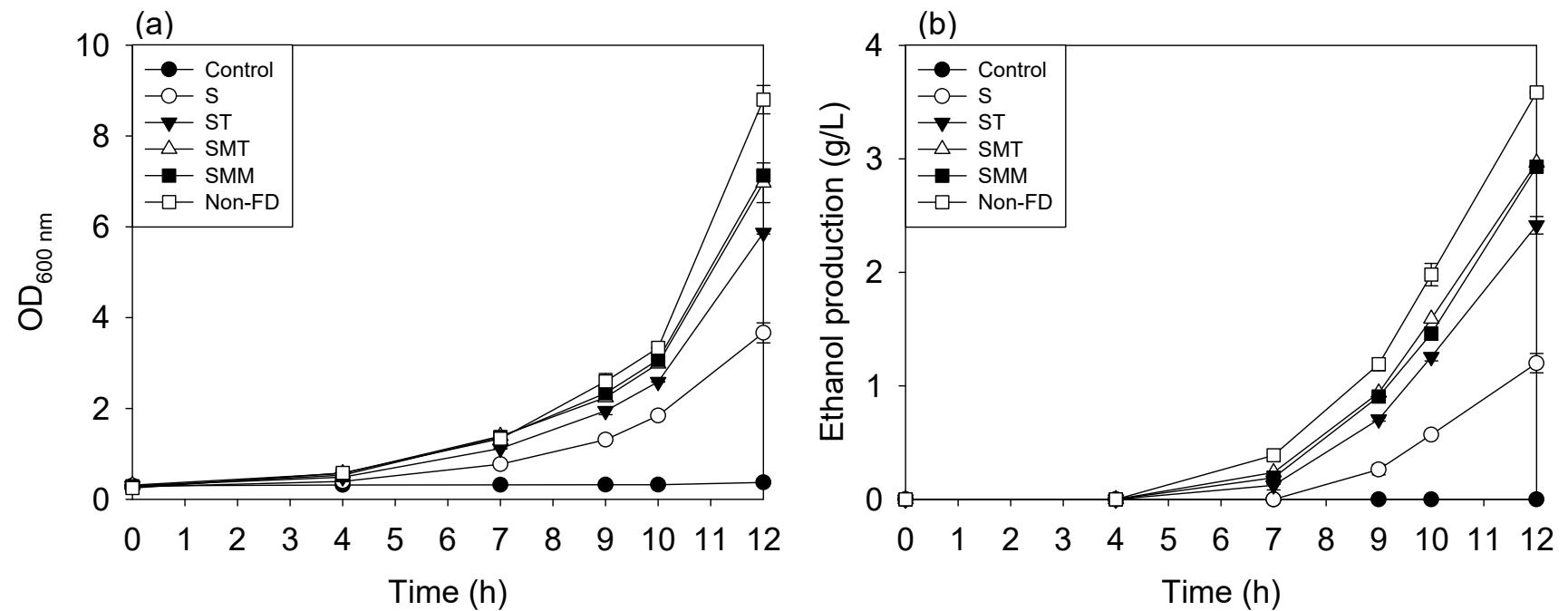


Figure S3. Effects of protectant combinations on cell growth (a) and ethanol production (b) of freeze-dried *S. cerevisiae* 88-4. Control, freeze-dried without protectant; S, skim milk; ST, skim milk/trehalose; SMT, skim milk/maltose/tween 40; SMM, skim milk/maltose/maltitol; Non-FD, not freeze-dried *S. cerevisiae* 88-4. Concentration of the protectants is listed in Table S1.