CLAIMS

1. A composition for use in cryoprotecting lactic acid bacteria, comprising (i) cysteine hydrochloride in an amount of 0.5-5 wt%, (ii) trehalose in an amount of 17.5-22.5 wt%, (iii) maltodextrin in an amount of 2.5-7.5 wt%, and (iv) soy peptone in an amount of 2.5-7.5 wt% as an active ingredient,

wherein the lactic acid bacteria is *Lactobacillus plantarum*.

2. The composition for use in cryoprotecting lactic acid bacteria of claim 1, which has thermal stability of lactic acid bacteria.

3. A method for producing a lactic acid bacteria preparation, comprising:

mixing lactic acid bacteria with a composition containing (i) cysteine hydrochloride in an amount of 0.5-5 wt% (ii) trehalose in an amount of 17.5-22.5 wt%, (iii) maltodextrin in an amount of 2.5-7.5 wt%, and (iv) soy peptone in an amount of 2.5-7.5 wt% to prepare a mixture; and

freeze-drying the mixture to be powdered,

wherein the lactic acid bacteria is *Lactobacillus plantarum*.

4. The method for producing a lactic acid bacteria preparation of claim 3, further comprising culturing bacterial cells of the lactic acid bacteria in a culture medium comprising cysteine hydrochloride before freeze-drying the mixture.

5. A method for increasing thermal stability of lactic acid bacteria in a freeze-dryed preparation, comprising

culturing lactic acid bacteria in a culture medium comprising cysteine hydrochloride; and

freeze-drying the cultured lactic acid bacteria using a composition comprising (i) cysteine hydrochloride in an amount of 0.5-5 wt%, (ii) trehalose in an amount of 17.5-22.5 wt%, (iii) maltodextrin in an amount of 2.5-7.5 wt%, and (iv) soy peptone in an amount of 2.5-7.5 wt%,

wherein the lactic acid bacteria is *Lactobacillus plantarum*.