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Studies on the acid-tolerance of probiotic Lactobacillus casei strain

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Lactobacillus is one of the most important probiotic lactic acid bacteria and is used in many probiotic dairy products. LProbiotics are live bacteria which beneficially affect the host by improving the intestinal microflora. As probiotic bacteria are usually delivered in a food system and their journey starts from the mouth to lower intestinal tract, probiotic bacteria must overcome physical/chemical barriers such as bile and acid in the gastrointestinal tract to maximize their beneficial effect. Hence, bile/acidtolerances are the two most important properties for selection of potential probiotic strains. In this study we induced acid-tolerant *Lactobacillus casei* (LC) strain by successive acid-adaptation. Acid-adapted strain retained their acid tolerant property for 20 times' successive subculture in the normal MRS media. However, more than 20 times subculture induced gradual loss of acid-tolerant property. We investigated expressions of 31 genes, reported that involved in acid-stress, in between normal LC and acid-adapted LC by real time RT-PCR analysis. Briefly, 7 genes expression were increased and 19 genes expression were decreased meaningfully. To analyze the protein expression changes involved in acid-tolerant LC. We identified 11 proteins involved in carbohydrate metabolism, energy metabolism, cell division, and stress response showed changed protein expression level depending on the acid-tolerance. Taken together, results presented here not only show an effective way to manage acid-resistant LC strains for the food industry, but also contribute the clues to elucidate mechanisms of acid tolerance of LC and provide new strategies to enhance the industrial use of probiotic LC.

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