

Viability, acid and bile tolerance of spray dried probiotic bacteria and some commercial probiotic supplement products kept at room temperature

Abstract

Production of probiotic food supplements that are shelf-stable at room temperature has been developed for consumer's convenience, but information on the stability in acid and bile environment is still scarce. Viability and acid and bile tolerance of microencapsulated *Bifidobacterium* spp. and *Lactobacillus acidophilus* and 4 commercial probiotic supplements were evaluated. *Bifidobacterium* and *L. acidophilus* were encapsulated with casein-based emulsion using spray drying. Water activity (a_w) of the microspheres containing *Bifidobacterium* or *L. acidophilus* (SD GM product) was adjusted to 0.07 followed by storage at 25 °C for 10 wk. Encapsulated *Bifidobacterium* spp. and *Lactobacillus acidophilus* and 4 commercial probiotic supplement products (AL, GH, RE, and BM) were tested. Since commercial probiotic products contained mixed bacteria, selective media MRS-LP (containing L-cysteine and Na-propionate) and MRS-clindamycin agar were used to grow *Bifidobacterium* spp. or *L. acidophilus*, respectively, and to inhibit the growth of other strains. The results showed that a_w had a strong negative correlation with the viability of dehydrated probiotics of the 6 products. Viable counts of *Bifidobacterium* spp. and *L. acidophilus* of SD GM, AL, and GH were between 8.3 and 9.2 log CFU/g, whereas that of BM and RE were between 6.7 and 7.3 log CFU/g. *Bifidobacterium* in SD GM, in AL, and in GH products and *L. acidophilus* in SD GM, in AL, and in BM products demonstrated high tolerance to acid. Most of dehydrated probiotic bacteria were able to survive in bile environment except *L. acidophilus* in RE product. Exposure to gastric juice influenced bacterial survivability in subsequent bile environment.