

Abstract

Probiotics are live bacteria that are thought to impart health benefits to humans and animals. Despite growing consumer interest in products containing probiotics, the scientific basis for their purported beneficial effects is not well understood. *Lactobacillus* are widely marketed as probiotics for improving gastric transit time, improving cholesterol, and protecting against infection with pathogens. However, clinical evidence in both humans and animals suggests that *Lactobacillus*-based probiotics can also contribute to unexpected weight changes. Recent research has linked these weight changes with a family of enzymes known as Bile Salt Hydrolases (BSH's) which are commonly produced by *Lactobacillus*. We expanded on these findings by showing that supplementing mice with *Lactobacillus* expressing high levels of BSH for only two weeks results in significant weight gain. Here, we propose to investigate whether *Lactobacillus*-based probiotics are capable of regulating metabolism by altering intestinal expression of BSH. This research will enhance current understanding of how probiotics influence host metabolism, and provide a foundation for predicting clinical outcomes. Ultimately, this work will inform future studies aimed at developing probiotics as tools for controlling obesity and reliably replacing antibiotic growth promoters in food animal production.