

Honey varieties impact survivability of *Bifidobacterium animalis* ssp *lactis* in commercial yogurt through simulated in vitro digestion

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Introduction: While numerous studies evaluated the probiotic properties of *Bifidobacterium animalis* ssp. *lactis* (*B. animalis*), how this bacterium interacts with honey in yogurt through the digestive process is limited. The study objective was to evaluate the effects of different honey varieties and concentrations on *B. animalis* survivability in yogurt through in vitro digestion. We hypothesize that adding the varieties to a yogurt matrix would improve probiotic survivability through in vitro complete digestion.

Methods: Yogurt, honey or control treated, underwent in vitro simulated oral, gastric, and intestinal digestion. Probiotic cells were enumerated on MRS medium and anaerobic incubation, followed by an overlay of selective MRS medium and anaerobic incubation. Probiotics were quantified at pre-digestion and after oral, gastric, intestinal digestion. Phase 1 included 4 honey varieties at 20% w/w per 170g of yogurt; phase 2 tested 7 levels of clover honey (20, 14, 10, 9, 8, 6, and 4% w/w) per 170g of yogurt.

Results: Similar probiotic counts were observed between all treatments after oral and gastric digestion (<1 Log CFU/g probiotic reduction after gastric phase). Higher *B. animalis* survivability was observed in yogurt with clover honey after exposure to simulated intestinal fluids (~3.5 Log CFU/g reduction) compared to all control treatments (~5.5 Log CFU/g reduction). The 20%, 14%, and 10% w/w clover honey similarly supported *B. animalis* survivability after exposure to simulated intestinal fluids.

Discussion: There was comparable *B. animalis* survivability in yogurt with alfalfa, buckwheat, and orange varieties relative to controls in all phases of in vitro digestion. In addition, the effective dose was demonstrated to be 1 to 2 tablespoons (10 to 20% w/w) of clover honey per serving (170g) of yogurt for increased probiotic survivability during in vitro digestion. In summary, the culinary combination of yogurt with clover honey supports *B. animalis* survivability during in vitro digestion.