P34 & FP – **The more the better: effect of cell concentration on the persistence of four probiotic strains in the human intestine**

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Background: Reportedly, daily consumption of at least one billion viable probiotic cells is recommended for potential effect on the host. Nonetheless, more precise recommended dosages for probiotic intake are not established. Investigation on the outcome of the intake of different probiotic dosages is therefore required, especially for multi-strain formulations, in which a possible inter-microbe interference is postulated.

Objective: This study aimed to evaluate the influence of cellular dosage on the ability of four probiotic bacteria in a multi-strain blend to persist in human gastrointestinal tract.

Methodology: Forty healthy adult volunteers participated to a single-blinded, randomized, parallel group pilot trial. Each subject consumed daily a capsule containing 7 or 70 billion CFU of a probiotic blend composed of *Bifidobacterium animalis* subsp. *lactis* Bl-04 (10.7 or 9.7 $\log_{10}$CFU per formulation), *Lactobacillus acidophilus* La-14 (10.1 or 9.1 $\log_{10}$CFU), *Lactobacillus plantarum* SDZ-11 (9.4 or 8.4 $\log_{10}$CFU) and *Lactobacillus paracasei* SDZ-22 (8.8 and 7.8 $\log_{10}$CFU). Quantitative-PCR with strain-specific primers was used to detect and quantify the probiotic strains in fecal samples collected during the administration (2 weeks) and follow-up (2 weeks) phases. Fecal samples from the last day of probiotic administration were also used for strain-specific semi-quantitative estimation of viable probiotic cells.

Results: Strain Bl-04, which was present in highest amount in the formulations, was recovered from all volunteers. On the contrary, La-14 and SDZ-11 were recovered from all subjects receiving the 70 billion formulation, and from 90 and 80% of subjects in the 7 billion treatment group respectively. Finally, strain SDZ-22, which was the least abundant in the formulations, was recovered from 90 and 20% of the subjects in 70 and 7 billion treatment groups respectively. On average, the detection of probiotic strains was anticipated of about 1 day, ended 3 days later and resulted 3 days longer. The viable recovery at the end of the administration period was successful in all fecal samples for all strains in the 70 billion group, whereas 11% of samples in 7 billion group resulted negative. The number of viable cells recovered was also significantly higher in 70 vs 7 billion treatment group.

Conclusions: This study demonstrates that different strains, belonging to diverse taxa, may co-exist and be selectively quantified upon ingestion in a multi-species probiotic formulation. Moreover, we highlight that higher dosages of bacterial cells in probiotic formulations may allow a higher, anticipated and longer recovery of the probiotic strains in the feces of healthy adults.