**Limitations of L. acidophilus as the species of choice in Lactobacillus therapy**

To be effective in the therapeutic situations described above, the Lactobacillus species should be efficiently implanted in the intestine following oral administration. This requires that the cells survive the rigors of preparation in dosage forms, storage and passage through the acidic gastric environment. On reaching the intestine, these cells should be able to establish themselves, remain viable, carry on their normal metabolic activities and proliferate extensively to perform their antagonistic functions against pathogens, for prolonged periods of time.

L. acidophilus has been the probiotic of choice for several years. However, the effectiveness of treatment with this species is uncertain. Although standards for L. acidophilus are established in the USA, it has been reported that such preparations contain less than 1000 cells of viable bacteria against claims of billions. Besides, some probiotic supplements claiming to have viable cells of L. acidophilus present in large numbers have only very low numbers and others that claim to have one species of Lactobacillus, have a totally different species.

The evidence for the effectiveness of L. acidophilus probiotics as antidiarrheal agents is not convincing. Attempts at administration of L. acidophilus preparations as a prophylactic against infantile diarrhea have proven unsuccessful.

Quoting from a US Expert Panel report:

" In the past 60 years, well over 200 papers have reported on the use of Lactobacillus acidophilus and other Lactobacillus organisms in the treatment of diarrhea. Despite the proliferation of studies, the very few controlled studies often show lack of effectiveness."

The unsuccessful record of L. acidophilus and other lactobacilli in this context could be due to their failure to implant themselves in the intestine and proliferate sufficiently to perform their healthful activities. Another important factor against L. acidophilus as a probiotic is that its cells do not survive spray drying. The freeze-dried cultures have to be stored under refrigeration and do not retain viability under normal conditions. According to Black, the survivability in low pH and bile of the gastrointestinal tract, moisture, high temperature and oxygen, are all parameters with lethal effects on lyophilized L. acidophilus .

The search for an effective lactic acid bacterial species for use as a probiotic has included clinical trials with the commonly used lactobacilli in addition to L. acidophilus. These include: L. bifidus, L. casei, L.brevis sub species coagulans, L.bulgaricus and S. faecalis. However, none of these cultures have provided consistently successful results.

The alternatives are:

1. To use a genetically engineered Lactobacillus with the required characteristics. (NO GMO PLEASE)
2. To use an effective spore-bearing species which can survive the gastric acidity and proliferate in the intestine, viable cells being observed in the feces of the host, long after probiotic treatment.

Alternative 1 is as yet unavailable (Thank goodness).

The second alternative favors the use of B. coagulans as a probiotic. B. coagulans spores are stable to heat, acids, bile and other deleterious chemicals. Negligible falls in viable counts were observed experimentally at 40° C and a relative humidity of 80% for two months, when heated with water at 60 to 90° C for 30 minutes and when tested at pH of 2 for varying durations.

**B. coagulans is the probiotic used in LifeSpan Globals' ImmuniPro**