



PROBIOTIC INTRODUCTION

RATIONALE

- Probiotics are viable microorganisms that have beneficial health effects.
- If the viability of probiotics is not maintained at the time of consumption, the purpose of probiotics is not fulfilled.
- Probiotics survival is affected by various factors (mainly during processing and storage), so their **survival is very important at the time of consumption.**



INTRODUCTION

- The term "probiotics" comes from the Greek word "pro bios" meaning "for life"
- **Probiotic** bacteria are live microorganisms, which when administered in adequate amounts confer a health benefit to the host (WHO, 2002).
- Most common probiotic strains - *Bifidobacterium* and *Lactobacillus*.



PROBIOTIC STRAINS

Lactobacillus *species*

- *L. acidophilus*
- *L. plantarum*
- *L. casei*
- *L. brevis*
- *L. delbreuckii*



Bifidobacterium *species*

- *B. bidifum*
- *B. longum*
- *B. infantis*
- *B. breve*



others

- *Enterococcus faecalis*
- *Streptococcus cremoris*



DESIRABLE PROPERTIES OF PROBIOTICS



Acid & bile stability,

Adhesion stability.

Antimicrobial activity

Viability & properties
during processing and
storage



PROBIOTICS: MODE OF ACTION

Production of inhibitory substances

- Organic acids
- Hydrogen peroxide
- bacteriocins

Stimulation of immunity

- Various cytokines are released

Competition for nutrients

- Consume nutrients that may be otherwise consumed by pathogens



CONTINUED...

Blocking of adhesion sites

- Competitive inhibition to adhesion on epithelial receptors

Degradation of toxin receptors

- Degradation of receptors on intestinal mucosa

Affecting the host gene expression

- Secreted molecules regulate gene expression



HEALTH EFFECTS OF PROBIOTICS



Protection against gastrointestinal pathogens and diarrhoea



Enhancement of immune system



Reduction of serum cholesterol level and blood pressure



Production of B-vitamins

CONTINUED...



Protection against colon cancer



Prevention of osteoporosis



Increase of lactose tolerance



Protection against allergy

DOSES OF PROBIOTICS

- According to US FDA, minimum probiotic count in a probiotic food should be at least **10^6 CFU ml⁻¹**
- A daily intake of **10^8 – 10^9 probiotic** microorganisms is essential to achieve probiotic action in the human organism
- Probiotic products should be consumed regularly with an approximate amount of **100 g/day** in order to deliver sufficient viable cells into the intestine.



CHALLENGES & SCOPE

- **Challenges** in **food** **during** **the** **processing** **and** **storage** **agents** **of**
- **Scope:** Identification of **effective methods for protection of cells** during processing and storage, ex- microencapsulation, use of cell protective agents etc.

