

## **CHAPTER 1**

# **INTRODUCTION**

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From the prehistoric time fermented foods are prepared and consumed. Fermentation improves the taste and shelf-life of the food materials. Worldwide various traditional fermented foods are prepared and consumed by different ethnic groups or tribes. Arrays of traditional fermented foods are produced in Asia. Traditional fermented food products are linked with desired microbes which are valuable for human health. Research in the field of traditional fermented food products are escalating as a source of new isolates and yielding to interesting strains with potential probiotic properties. These isolates may create opportunities in the clinical, medical, and pharmaceutical domains to develop new functional products with desired health benefits. Unhealthy food habits or consuming processed foods that are rich in artificial preservative, fats, drugs, alcohol, and stressful life styles can adversely affect the natural microbial balance in the gut ecosystem. Incorporating probiotic or live beneficial microbes isolated from traditional fermented foods to the diet would modulate gut microflora and improve the health and well-being.

The advantageous attributes associated with fermented food would improve health was hypothesized in the beginning of the 20<sup>th</sup> century by the Nobel Prize winner, Metchnikoff<sup>1</sup>. He proposed that good health and longevity of the Bulgarian peasants was due to the consumption of fermented milk products containing *Lactobacillus bulgaricus*. The belief of the beneficial effect of these microbes on human health has become one of the foundations for exploring the knowledge on human food. Health benefits resulting from the utilization of products containing lactic acid bacteria (LAB) have been well documented in several studies, which have revealed that certain species of LAB have exclusive characteristics that may have an effect on the performance of the human microbiota. The culmination of such attributes is termed as 'probiotic'. The term was first introduced by Vergio<sup>2</sup>; however first definition of probiotics was given by Fuller<sup>3</sup> as "A live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance". Since then, several definitions have been put forth by various researcher and health organization. Presently, the consensus definition given by the International Scientific Association for probiotics and prebiotics<sup>4</sup> is commonly

accepted, which defined probiotics as ‘live microorganisms that, when administered in adequate amounts, confer a health benefit on the host’.

Several reports have shown that traditional fermented foods contain plethora of microorganisms with probiotic characteristics<sup>5, 6, 7</sup>. LAB contributes major role in the production of fermented foods and prevent the growth of undesirable microorganisms by producing antimicrobial substances and organic acids. The applications of probiotics have been studied as human dietary supplement and animal feed. The most considerable effects of probiotics have been reported after incorporation of live beneficial microbes in the animal feed during stressful periods for the gut microbiota and the animal: at weaning; at the beginning of the lactation period; and after a dietary shift from high forage to high readily fermentable carbohydrates<sup>8</sup>. Probiotics with cellulolytic potential converts the highly recalcitrant cellulose to fermentable mono- and oligo-saccharides that can be easily assimilated in the body, thus improving utilization of dietary carbohydrate and enhancing digestion. The byproducts formed after action of enzymes is utilized as a prebiotic source by probiotics and thus enhancing digestion of dietary feed rich in cellulose. The use of probiotics as animal feed additives demands these attributes and thus envisages a tremendous scope. Also the animal health benefit applications of probiotics have been burgeoning in the recent years.

The North Eastern part of India is inhabited by various ethnic groups who developed different types of ethnic food to meet their nutritional demands. These regions have profound diversity with a plethora of untapped microbial resources. For the present study, traditional fermented food of Assam and Arunachal Pradesh, mainly fermented milk product (Curd, locally known as *Doi*) and fermented soybean (Churpi) were studied. Since the beneficial roles imparted by traditional fermented foods are mainly based on the microflora they harbor, so there is a need to explore the untapped microbial diversity of these fermented foods. Although foods incorporated with potential probiotic are extensively consumed, there is still paucity of information regarding their ecology, diversity, and functionality in respect to the affect on the host. The critical challenge is to recognize which strain will be most likely to thrive for a selective health benefit. The traditional fermented food of North-East, India warrants attention as diet which may have outstanding influence on the human health.

Considering the above aspects, present study has been carried out with the following objectives

1. Screening and isolation of potential probiotics from raw milk samples for developing functional foods.
2. Selection and characterization of cholesterol lowering probiotics from fermented milk products of Assam.
3. Screening of cellulolytic probiotics from traditional fermented soybean (Churpi) of Arunachal Pradesh as an animal feed supplement.

## References

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