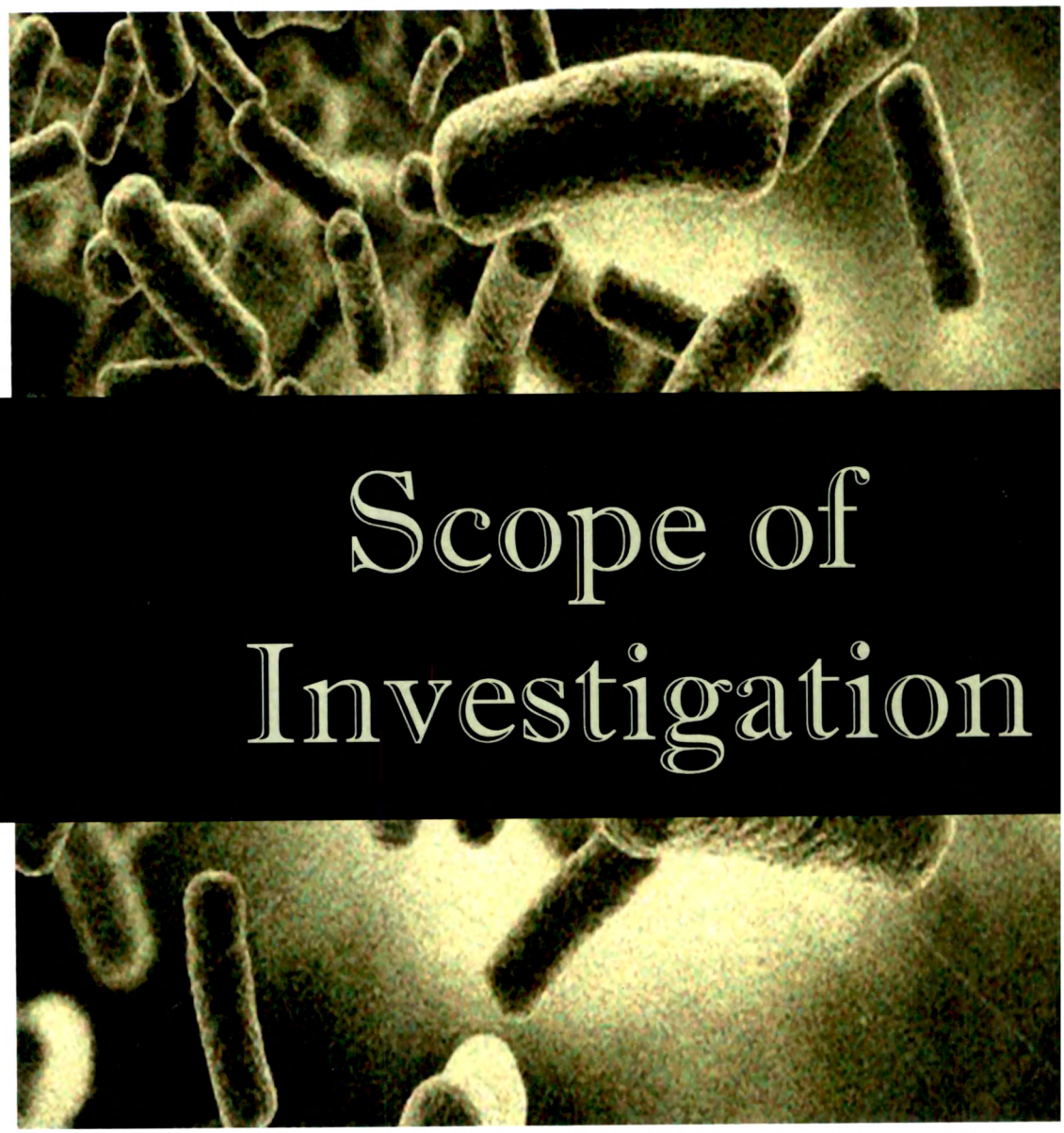

Scope of Investigation

CHAPTER 3

SCOPE OF INVESTIGATION

Based on the literature survey, in the present study entitled **"Acceptability trials of fructooligosaccharide (FOS) substituted food products and impact evaluation of FOS supplementation in type 2 diabetic adults in terms of their glycemia, gut incretin (GLP-1) and gut microbiota"** following working hypothesis has been formulated:

- Fructooligosaccharide substituted food products vary in their physical, organoleptic characteristics and FOS content in these food products after processing.
- Ten gram FOS supplementation for 8 weeks improves glycemic, lipemic parameters. GLP-1 and beneficial gut microflora (*LAB and bifidobacteria*) in type 2 diabetic subjects.

To authenticate the above mentioned hypothesis present study was undertaken with the following objectives-

PHASE I – Development of FOS incorporated food products and studying their various organoleptic attributes, overall acceptability and the recovery of FOS during processing of these products using HPLC technique.

- Supplementing FOS in the base material of popular Indian food products i.e. *Chapati, Thepla, Dhokla* and *Patra* at varying levels.
- Conducting the organoleptic evaluation of FOS incorporated food products and study their acceptability.
- Studying the recovery of FOS in selected food products during various processing conditions using HPLC technique.

PHASE II – Collection of baseline data of type 2 diabetic subjects attending health clinic of M.S. University of Baroda in terms of anthropometry, dietary, biophysical, glycemic, lipemic, GLP-1 and gut microbiota (LAB, bifidobacteria and enteric pathogen) and understanding the correlations between various parameters.

- Snapshotting the prevalence of type 2 diabetes and collecting data on baseline information in terms of socio-economic status, lifestyle history and medical history of type 2 diabetic subjects.
- Assessing the nutrient intakes, food frequency and frequency of consumption of probiotic and prebiotic foods in type 2 diabetic subjects.
- Assessing anthropometric measurements and biophysical measurements (blood pressure) of the subjects.
- Determining glycemic parameters (FBS, PP2 and HbA_{1c}), lipemic parameters (TC, TG, HDL, LDL and VLDL) and gut incretin- Glucagon like peptide-1 (GLP-1) of the type 2 diabetic subjects.
- Analyzing stool samples of type 2 diabetic subjects by enumeration of gut microflora in terms of *Bifidobacteria, Lactobacillus* and Enteric pathogen.
- Understanding the correlations between glycemic, lipemic and gut microbiota.

PHASE III- Effect of Fructooligosaccharide (FOS) supplementation on Glycemic, lipemic parameters, Gut incretin (GLP-1) and Gut Microflora in type 2 diabetic adults.

- Studying the effect of FOS supplementation on glycemia by determining blood glucose, HbA_{1c} and gut incretin (GLP-1) before and after supplementation.
- Studying the effect of FOS supplementation on anthropometric profile, biophysical profile and lipemic profile of diabetic subjects.

- Studying the prebiotic effect of FOS supplementation by determining fecal microbial counts *(Lactobacillus, Bifidobacteria* and Enteric pathogens) before and after supplementation.
- Studying the effect of dietary factors and the physical activity pattern on the establishment of probiotic bacteria in the gut after FOS supplementation.