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.
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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 HbA1c), 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, HbA1c 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.
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- 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.