# ABSTRACT

Dietary variations play a crucial role in determining a country's health and well–being. The onset of diet-related disorders is closely associated with food intake, specially oil intake. Blending of oils has become a more financially successful technique to improve oxidative stability and nutrient profile of oil by maintaining a balanced fatty acid profile in recent years. Thus, blending oils to create an alternative cooking medium with desired health advantages is the need of the day. The study was carried out in four phases. In Phase I, a survey on household consumption of dietary fat was done among 196 households at Coimbatore and a market survey on the availability of blended vegetable oil was carried out in eight outlets. In Phase II, the formulation of six blended vegetable oils **BOGN-I** ( Groundnut oil-50 ml + gingelly oil-12.5 ml + sunflower oil-12.5 ml + safflower oil-12.5 ml + flaxseed oil-12.5 ml), BOGO-II- Gingelly oil-50 ml + groundnut oil-12.5 ml + sunflower oil-12.5 ml + safflower oil-12.5 ml + flaxseed oil-12.5 ml, BOSF-III-Sunflower oil-50 ml + groundnut oil-12.5 ml + gingelly oil-12.5 ml + safflower oil-12.5 ml + flaxseed oil-12.5 ml, BOSFO-IV – Safflower oil-50 ml + groundnut oil-12.5 ml +gingelly oil-12.5 ml+ sunflower oil-12.5 ml + flaxseed oil-12.5 ml, BOFO-V-Flaxseed oil-50 ml + groundnut oil-12.5 ml + gingelly oil-12.5ml+ sunflower oil-12.5 ml + safflower oil-12.5 ml, BOEP-VI- Groundnut oil-20 ml + gingelly oil-20 ml + sunflower oil-20 ml + safflower oil-20 ml and flaxseed oil-20 ml was done and their physical, chemical and sensory attributes were tested using standard procedure. In Phase III, the fatty acids profile of formulated blended vegetable oil was analyzed using a gas Chromatography - Flame Ionization Detector). In Phase IV, the absorption of oil and fatty acids profile of selected recipes cooked (Deep fat frying - vadai, Pan frying - chapatti, Sautéing - potato poriyal) using formulated blended vegetable oils were analyzed (GC-FID). **Results** : Forty eight percent of households belonged to an upper lower socio-economic group. The consumption of groundnut oil was found to be maximum (108ml) followed by sunflower oil (87 ml). Blending of more than three oils was not observed. The refractive index of blended vegetable oils ranged between 1.45 and 1.46. The BOSFO-IV (0.92 ± 0.11g/ml) with 50 ml of safflower oil reported least density. The smoking temperature of blended vegetable oils ranged between 157ºC and 194.4ºC. The saponification value of blended vegetable oil ranged between (190.67 ± 0.58 mg/KOH to 261.67 ± 0.58 mg/KOH). The

lowest acid value was reported in BOFO-V (1.36 ± 0.00 mgKOH/g), followed by BOSFO-IV (1.92 ± 0.017 mgKOH/g).The free fatty acid level of blended vegetable oil ranged between 0.66±0.05 % to 1.11 ± 0.01% . The highest amount of saturated fat was found in BOSFO-VI (40g) and the least in BOGO-II (14.35g). The presence of methyl linoleate a n-6 fatty acids was found to be high in BOSF-III (59.299%) and BOSFO-IV (55.812%). Also, the presence of methyl eicosenate a MUFA was found to be high in BOFO-V (22.450%) compared to stand-alone oil (groundnut oil- 0.702%, gingelly oil- 0.239%, sunflower oil- 0.150%, flaxseed oil - 0.703%). The percentage of trans fat was found to be <0.1g in all blended and stand-alone oils. For sautéing (potato poriyal), the presence of methyl linoleate was found to be higher in BOSFO-IV (55.812%) followed by BOSF-III (47.860%) compared to gingelly oil (37.983%) and groundnut oil (34.151%). The BOSF-III and BOSFO-IV were found to be superior in physical and chemical properties. Cooked products were found to be low in saturated fats, and high in MUFA and PUFA. Hence it can be recommended as healthier oils compared to stand-alone oils.

**Keywords:** Fatty Acids, Flaxseed oil, Gingelly oil, Groundnut oil, Vegetable Oils, Safflower oil and Sunflower oil.