The study entitled “Nutritional Enrichment of Wheat Flour Based Products By Incorporation of Carrot, Lotus Stem, Flax Seed Flour and Admixture of These Flours” was carried out with six objectives: (i) To estimate the chemical composition of selected Flours. (ii) To find out feasibility of addition of vitamin A, iron, calcium and fibre rich flours in wheat flours and prepare micronutrient enriched food products. (iii) To evaluate the sensory attributes of the prepared food products. (iv) To determine the nutritional quality of the prepared food products. (v) To determine the total plate count and coliform bacteria of the prepared food products. (vi) To determine the actual cost of the prepared food products. (vii) To compile recipe along with their nutritional composition and prepare a booklet. These Flours were analyzed for proximate composition, energy, protein, fat, carbohydrate, fiber, calcium, iron phosphorus, carotene, sodium and potassium by AOAC (1997) methods. The Carrot Flour, Lotus Stem flour and Flax Seed Flour were incorporated in Wheat flour to prepare food products namely: Carrot Balu Shahi, Carrot Cookies, Carrot Ladoo, Lotus Stem Lado, Lotus Stem Puri, Lotus Stem Noodles, Flax Seed Ladoo, Flax Seed Khurma, Flax Seed Puri and Multi Flour Ladoo, Multi Flour Meeethi Kachauri and Multi Flour Khurma with one control (T₀) and four treatments for each product T₁, T₂, T₃ and T₄ at different percent incorporation levels with different flours. Sensory characteristics of freshly prepared products were assessed on a nine point Hedonic Scale by a panel of five experts. For assessing nutritive value of the products the food composition tables of Gopalan 2007 as well as the values obtained by the investigator for the selected materials were used. Microbial analysis with regard to total plate count and coliform bacteria test were determined by Aneja 2010. Their cost of the products were calculated from the cost of row materials used.

The chemical analysis of the Flours (Wheat flour, Carrot flour, lotus stem flour and flax seed flour) were done by replicating them 3 times respectively and in each replication, these flours was tested for moisture, fat, protein, carbohydrate, energy, fiber, calcium, iron, total carotene, and phosphorus.
The results obtained showed that the highest moisture content of 11.31 percent was recorded in wheat flour followed by lotus stem flour (9.45 percent), carrot flour (8.3 percent) and flax seed flour (5.7 percent).

Flax Seed Flour had the highest average Protein content of 17.5g/100g. followed by wheat flour (12.86g./100g.), lotus stem flour (4.06 g/100g.) and carrot flour (0.7 g/100g.).

Flax Seed Flour had the highest average Fat content of 38.3 g/100g. followed by wheat flour (1.40 g./100g.), lotus stem flour (1.29 g/100g.) and carrot flour (0.2 g/100g.).

Lotus stem Flour had the highest average Carbohydrate content of 51.3 g/100g. followed by wheat flour (73.15 g./100g.), flax seed flour (35.0 g/100g.) and carrot flour (10.1 g/100g.).

Flax Seed Flour had the highest average Energy content of 450 Kcal/100g. followed by wheat flour (339 Kcal/100g.), lotus stem flour (234 Kcal/100g.) and carrot flour (44 Kcal/100g.).

Lotus stem Flour had the highest average Fiber content of 24.6 g/100g. followed by flax seed flour (3.9 g./100g.), wheat flour (1.2 g/100g.) and carrot flour (1.1 g/100g.).

Flax Seed Flour had the highest average Calcium content of 236 mg/100g. followed by lotus stem flour (127.8 mg./100g.), carrot flour (100 mg/100g.) and wheat flour (41 mg/100g.).

Lotus stem Flour had the highest average Iron content of 60.55 mg/100g. followed by flax seed flour (5 mg./100g.), wheat flour (4.1 mg/100g.) and carrot flour (1.01 mg/100g.).

Carrot Flour had the highest average Total Carotene content of 1701 µg/100g. followed by flax seed flour (28 µg/100g.), wheat flour (24 µg./100g.) and total carotene content was not found in lotus stem flour.
Carrot Flour had the highest average Phosphorus content of 525 mg/100g, followed by flax seed flour (350 g/100g), wheat flour (348 g/100g) and lotus stem flour (120 g/100g).

**Sensory scores** of *Carrot Balu Shahi* with and without incorporation of the *Carrot Powder* combinations showed that the overall acceptability was highest in T1 (10 percent) level of incorporation followed by T2 (20 percent) and there was significant difference between the two. T3 (20 percent) was found to be more acceptable than T0 (control) and T4 (10 percent).

In *Carrot Cookies*, the sensory score of T2 (20 percent) was best regarding the overall acceptability followed by T3 (30 percent), the treatment T1 (10 percent) was found to be more acceptable than T4 (40 percent) and T0 (control).

In *Carrot Ladoo*, the sensory score of T3 (30 percent) was best regarding the overall acceptability followed by T4 (40 percent), the treatment T2 (20 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).

**Sensory scores** of *Lotus Stem Ladoo* with and without incorporation of the *Lotus Stem Flour* combinations showed that the overall acceptability was highest in T4 (40 percent) level of incorporation followed by T3 (30 percent) and there was significant difference between the two. T1 (10 percent) was found to be more acceptable than T2 (20 percent) and T0 (control).

In *Lotus Stem Puri*, the sensory score of T3 (30 percent) was best regarding the overall acceptability followed by T2 (20 percent), the treatment T4 (40 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).

In *Lotus Stem Noodles*, the sensory score of T4 (40 percent) was best regarding the overall acceptability followed by T3 (30 percent), the treatment T2 (20 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).
Sensory scores of **Flax seed Ladoo** with and without incorporation of the **Flax seed Flour** combinations showed that the overall acceptability was highest in T3 (30 percent) level of incorporation followed by T2 (20 percent) and there was significant difference between the two. T4 (40 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).

In **Flax seed Khurma**, the sensory score of T3 (30 percent) was best regarding the overall acceptability followed by T4 (40 percent) and there was significant difference between the two. T2 (20 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).

In **Flax seed Puri**, the sensory score of T4 (40 percent) was best regarding the overall acceptability followed by T3 (30 percent) and there was significant difference between the two. T2 (20 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).

Sensory scores of **Multi flour Khurma** with and without incorporation of the **Multi Flour** combinations showed that the overall acceptability was highest in T2 (20 percent) level of incorporation followed by T3 (30 percent) and there was significant difference between the two. T1 (10 percent) was found to be more acceptable than T4 (40 percent) and T0 (control).

In **Multi flour Meethi Kachauri**, the sensory score of T1 (10 percent) was best regarding the overall acceptability followed by T2 (20 percent) and there was significant difference between the two. T3 (30 percent) was found to be more acceptable than T0 (control) and T4 (40 percent).

In **Multi flour Ladoo**, the sensory score of T4 (40 percent) was best regarding the overall acceptability followed by T3 (30 percent) and there was significant difference between the two. T2 (20 percent) was found to be more acceptable than T1 (10 percent) and T0 (control).
The Nutrient Estimation showed that $T_4$ (40 percent) has the maximum Fat, Fibre, Carbohydrate, Phosphorus, $\beta$-Carotene and Sodium content and $T_0$ (Control) has the minimum Fat, Fibre, Carbohydrate, Phosphorus, Carotene and Sodium content in *Carrot Balu Shahi Carrot Ladoo and Carrot Cookies*.

The Protein, Energy and Potassium estimation for *Carrot Balu Shahi, Carrot Ladoo and Carrot Cookies* shows that $T_0$ (control) has the maximum Protein, Energy and Potassium content for each product respectively.

The Nutrient Estimation showed that $T_4$ (40 percent) has the maximum Fibre, Carbohydrate, Calcium, Iron, Sodium and Potassium content and $T_0$ (Control) has the minimum Fibre, Carbohydrate, Calcium, Iron, Sodium and Potassium content in *Lotus Stem Ladoo, Lotus Stem Puri and Lotus Stem Noodles*.

The Protein, Energy Carbohydrate, Phosphorus and Carotene estimation for *Lotus Stem Ladoo, Lotus Stem Puri and Lotus Stem Noodles* shows that $T_0$ (control) has the maximum Protein, Energy Carbohydrate, Phosphorus and Carotene content for each product respectively. Finally in case of Fat for *Lotus Stem Ladoo and Lotus Stem Puri* shows that $T_0$ (Control) has maximum Fat content for each product respectively and $T_4$ (40 percent) has the maximum Fat Content in *Lotus Stem Noodles*.

The Nutrient Estimation showed that $T_4$ (40 percent) has the maximum Protein, Fat, Fibre, Energy, Calcium, Phosphorus, Iron, Sodium and Potassium content and $T_0$ (Control) has the minimum Protein, Fat, Fibre, Energy, Calcium, Phosphorus, Iron, Sodium and Potassium content in *Flax Seed Ladoo, Flax Seed Khurma and Flax Seed Puri*.

The Carbohydrate estimation for *Flax Seed Ladoo, Flax Seed Khurma and Flax Seed Puri* shows that $T_0$ (control) has the maximum Carbohydrate content for each product respectively.

The Nutrient Estimation showed that $T_4$ (40 percent) has the maximum Fat, Fibre, Calcium, Phosphorus, Iron, Carotene, Sodium and Potassium content and $T_0$ (Control) has the minimum Fat, Fibre, Calcium, Phosphorus, Iron, Carotene, Sodium and...
Potassium content in Multi Flour Khurma, Multi Flour Meethi Kachuri and Multi Flour Ladoo.

The Protein and Carbohydrate estimation for Multi Flour Ladoo, Multi Flour Khurma and Multi Flour Meethi Kachuri shows that T₀ (control) has the maximum Protein and Carbohydrate content for each product respectively.

The highest average total plate count (TPC) of Carrot Balu Shahi was recorded in T₀ (1.8), followed by T₁ (1.6), T₃ (1.6), T₄ (1.6) and T₁ (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation of Carrot Balu Shahi which means that negative result for coliform test done after preparation of Carrot Balu Shahi.

The highest average total plate count (TPC) of Carrot Cookies was recorded in T₀ (1.8), followed by T₁ (1.6), T₂ (1.4), T₃ (1.4) and T₄ (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation Carrot Cookies which means that negative result for coliform test done after preparation of Carrot Cookies.

The highest average total plate count (TPC) of Carrot Ladoo was recorded in T₀ (1.8), followed by T₂ (1.6), T₁ (1.4), T₃ (1.4) and T₄ (1.4). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.
The value less than one coliform/g of sample was observed after preparation *Carrot Ladoo* which means that negative result for coliform test done after preparation of *Carrot Ladoo*.

The highest average total plate count (TPC) of *Lotus Stem Ladoo* was recorded in T0 (1.6), followed by T1 (1.6), T3 (1.6), T2 (1.4) and T4 (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Lotus Stem Ladoo* which means that negative result for coliform test done after preparation of *Lotus Stem Ladoo*.

The highest average total plate count (TPC) of *Lotus Stem Puri* was recorded in T0 (1.8), followed by T1 (1.6), T2 (1.4), T3 (1.4) and T4 (1.4). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Lotus Stem Puri* which means that negative result for coliform test done after preparation of *Lotus Stem Puri*.

The highest average total plate count (TPC) of *Lotus Stem Noodles* was recorded in T0 (1.8), followed by T1 (1.6), T3 (1.6), T4 (1.6) and T2 (1.4). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Lotus Stem Noodles* which means that negative result for coliform test done after preparation of *Lotus Stem Noodles*. 
The highest average total plate count (TPC) of *Flax Seed Ladoo* was recorded in T0 (1.8), followed by T1 (1.6), T3 (1.6), T2 (1.4) and T4 (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Flax Seed Ladoo* which means that negative result for coliform test done after preparation of *Flax Seed Ladoo*.

The highest average total plate count (TPC) of *Flax Seed Khurma* was recorded in T0 (1.8), followed by T3 (1.6), T4 (1.6), T1 (1.4) and T2 (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Flax Seed Khurma* which means that negative result for coliform test done after preparation of *Flax Seed Khurma*.

The highest average total plate count (TPC) of *Flax Seed Puri* was recorded in T2 (1.8), followed by T0 (1.4), T1 (1.4), T4 (1.4) and T3 (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Flax Seed Puri* which means that negative result for coliform test done after preparation of *Flax Seed Puri*.

The highest average total plate count (TPC) of *Multi Flour Khurma* was recorded in T2 (1.8), followed by T0 (1.4), T1 (1.4), T4 (1.4) and T3 (1.2). After analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.
The value less than one coliform/g of sample was observed after preparation *Multi Flour Khurma* which means that negative result for coliform test done after preparation of *Multi Flour Khurma*.

The highest average total plate count (TPC) of *Multi Flour Meethi Kachauri* was recorded in T0 and T1 (1.8), followed by T2 (1.4), T3 (1.4), and T4 (1.2) after analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Multi Flour Meethi Kachauri* which means that negative result for coliform test done after preparation of *Multi Flour Meethi Kachauri*.

The highest average total plate count (TPC) of *Multi Flour Ladoo* was recorded in T0 (1.8), followed by T1 (1.6), T4 (1.6), T2 (1.2) and T3 (1.2) after analyzing the data for Total Plate Count (TPC), no significant difference was observed between various treatments, that is all were at par.

The value less than one coliform/g of sample was observed after preparation *Multi Flour Ladoo* which means that negative result for coliform test done after preparation of *Multi Flour Ladoo*.

Since to calculate the cost of various enriched products it was found the highest prices was of T4 among all the products namely: *Carrot Balu Shahi, Carrot Cookies, Carrot Ladoo, Lotus Stem Ladoo, Lotus Stem Puri, Lotus Stem Noodles, Flax Seed Ladoo, Flax Seed Khurma, Flax Seed Puri, Multi Flour Ladoo, Multi Flour Khurma, Multi Flour Meethi Kachauri*. The cost of the products increased as the incorporation level increased in all food products which prepared with different flours combination.
Conclusion

From the findings of the study undertaken, it is concluded that selected flours (wheat flour, carrot, lotus stem and flax seed flours) were found good source of nutrients i.e Energy, Protein Fat, Carbohydrate, Calcium, Iron, Phosphorus and Carotene. Carrot, Lotus Stem, Flax Seed Flour and Admixture Flours can be successfully incorporated with Wheat Flour to enhance the sensory and nutritional properties of the products made from them. The sensory scores of the prepared products with different flours were highly acceptable in terms of taste and flavour, body and texture, colour and appearance and overall acceptability when compared with control. The food products were prepared from carrot flour with wheat flour rich in fiber, phosphorus, carotene and sodium content were increase as the incorporation level increased. The food products were prepared from Lotus stem flour with wheat flour rich in fiber, calcium, iron sodium and potassium content were increase as the incorporation level increased. The food products were prepared from Flax seed flour with wheat flour rich in protein, fat, fiber, energy, calcium, phosphorus, sodium and potassium content were increase as the incorporation level increased. And the food products were prepared from Admixture flours with wheat flour rich in fat, fiber, calcium, phosphorus, iron, carotene sodium and potassium content were increase as the incorporation level increased. The microbiological analysis of the prepared food products. Total plate count and coliform bacteria was absent which below in presumble limits so it safe for consumption. The cost of the products increased as the incorporation level increased in all food products which prepared with different flours combination. The nutritious recipe booklet can be used by lower economically and socially group’s people.
**RECOMMENDATION:**

- The enriched food products can be easily included in the daily diet of every age group especially in children and women which can definitely increase their micro nutrients, vitamins, minerals and antioxidants intake and protect from nutritional diseases.

- The products in enriched with different nutritional flours need to be popularized for improving nutritional status for children’s and women’s health, especially vitamin A, fiber, calcium and iron status.

- Hygiene and sanitation is also important for children’s growth, if the food are cooked in hygienic environment than child having good health.

- Nutritional knowledge can be imparted to the children for their better growth and development and their brighter future.