SUMMARY AND CONCLUSION

The present research work “Process Standardization for Preparation of Gulabjamun Mix by using Spray and Drum Dried Skim Milk” was conducted with the following objectives:-

Objectives:-

- To standardize the process to formulate Gulabjamun mix prepared from Spray and Drum dried Skim milk with other ingredients.
- To study sensory characteristics of the Gulabjamun prepared from the formulated mix.
- To study the chemical and microbiological properties of the formulated mix.
- To estimate the cost of production of formulated Gulabjamun mix.

Treatment combination:

Four different ratios of skim milk powder (spray and drum dried) and two different levels of Maida, Suji and Vanaspati were used for making Gulabjamun mix. Gulabjamun mix prepared from different treatment combinations were compared with each other.

The different treatment combinations used in the experiment were represented as follows:

Details of treatment combination:

ST₁ – Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (50:20:10:18:2).
\textbf{ST}_2–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (50:22:8:18:2).}

\textbf{ST}_3–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (48:20:10:20:2).}

\textbf{ST}_4–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (48:22:8:20:2).}

\textbf{ST}_5–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (46:20:10:22:2).}

\textbf{ST}_6–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (46:22:8:22:2).}

\textbf{ST}_7–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (44:20:10:24:2).}

\textbf{ST}_8–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (spray dried), Maida, Suji, Vanaspati and Baking powder in the ratio (44:22:8:24:2).}

\textbf{DT}_1–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (50:20:10:18:2).}

\textbf{DT}_2–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (50:22:8:18:2).}

\textbf{DT}_3–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (48:20:10:20:2).}

\textbf{DT}_4–\textit{ Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (48:22:8:20:2).}
DT$_5$– Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (46:20:10:22:2).


DT$_7$– Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (44:20:10:24:2).

DT$_8$– Represent experimental Gulabjamun mix prepared from skim milk powder (Drum dried), Maida, Suji, Vanaspati and Baking powder in the ratio (44:22:8:24:2).

The different samples of Gulabjamun mix prepared from Spray and Drum dried Skim milk in each replication were evaluated for moisture, fat, protein, acidity, ash, standard plate count, yeast and mould count, organoleptic qualities like flavour, body and texture, colour and appearance, overall acceptability and cost of production of Gulabjamun mix.

Data obtained on these aspects were statistically analysed by factorial design and critical difference (CD) techniques. The results obtained after the analysis of Gulabjamun mix from Spray and Drum dried Skim milk are concluded as follows:

**Moisture content in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:**

- Highest per cent moisture of 8.70 for Gulabjamun mix prepared from drum dried skim milk was recorded in treatment DT$_1$. In most of the treatment combinations moisture content differed significantly.
Fat content in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:

- Highest per cent fat of 24.09 for Gulabjamun mix prepared from drum dried skim milk was recorded in treatment DT₈. In most of the treatment combinations fat content differed significantly.

Protein content in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:

- Highest per cent protein of 21.41 for Gulabjamun mix prepared from drum dried skim milk was recorded in DT₁. In most of the treatment combinations protein content differed significantly.

Acidity (%) in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:

- Highest percent acidity of 0.18 for Gulabjamun mix prepared from drum dried skim milk was recorded in DT₁. In most of the treatment combinations acidity percentage differed significantly.

Ash content in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:

- Highest percent ash of 4.3 for Gulabjamun mix prepared from spray dried skim milk was recorded in ST₁. In most of the treatment combinations ash content differed significantly.
Yeast and mould count/gm in Gulabjamun mix prepared from Spray and Drum Dried Skim Milk:

- Highest yeast and mould count of 4 for Gulabjamun mix prepared from spray dried skim milk was recorded in ST₂. In most of the treatment combinations yeast and mould count differed significantly.

SPC (10³ cfu/gm) in Gulabjamun Mix prepared from Spray and Drum Dried Skim Milk:

- Highest SPC of 8000 for Gulabjamun mix prepared from spray dried skim milk was recorded in treatment ST₂. There was non-significant difference in different treatment combinations.

Colour and appearance score of Gulabjamun prepared from Gulabjamun Mix (Spray and Drum Dried Skim Milk):

- Highest score of 8.6 for colour and appearance of Gulabjamun prepared from Gulabjamun mix made up of drum dried skim milk was recorded in treatment DT₁. The difference was found to be significant in most of the treatment combinations.

Body and texture score of Gulabjamun prepared from Gulabjamun Mix (Spray and Drum Dried Skim Milk):

- Highest score of 8.1 for body and texture of Gulabjamun prepared from Gulabjamun mix made up of drum dried skim milk was recorded in treatment DT₁. The difference was found to be significant in most of the treatment combinations.
Flavour score of Gulabjamun prepared from Gulabjamun Mix (Spray and Drum Dried Skim Milk)

- Highest score of 8.26 for flavour of Gulabjamun prepared from Gulabjamun mix made up of drum dried skim milk was recorded in DT1. The difference was found to be significant in most of the treatment combinations.

Overall acceptability score of Gulabjamun prepared from Gulabjamun Mix (Spray and Drum Dried Skim Milk):

- Highest score of 8.4 for overall acceptability of Gulabjamun prepared from Gulabjamun Mix made up of drum dried skim milk was recorded in DT1. The difference was found to be significant in most of the treatment combinations.

Cost of Gulabjamun Mix:

- The cost of Gulabjamun mix prepared from drums dried skim milk in treatment DT1 was estimated to be Rs.193/kg.
CONCLUSION

From the investigation, it is concluded that drum dried skim milk can be effectively used in the formulation of Gulabjamun mix by properly blending it in correct proportions with other ingredients like maida, suji, vanaspati and baking powder.

The data obtained from Organoleptic evaluation showed that the Gulabjamun prepared from formulated Gulabjamun Mix in treatment DT\textsubscript{1}(50:20:10:18:2) was found to be more acceptable in terms of colour & appearance, flavour, body and texture and overall acceptability. On the basis of chemical analysis, the formulated Gulabjamun mix in treatment DT\textsubscript{1} (50:20:10:18:2) showed maximum value for moisture, protein, acidity and ash but lower value for fat. On the basis of microbiological analysis the formulated Gulabjamun Mix in treatment DT\textsubscript{1} (50:20:10:18:2) showed satisfactory results for SPC and Yeast & Mould count. The cost of Gulabjamun mix prepared from drum dried skim milk was estimated to be Rs.193/kg. Thus, this study has shown a way, for effective utilization of drum dried skim milk powder to prepare Gulabjamun mix.
RECOMMENDATION

From the investigation on Gulabjamun mix, the following researches maybe recommended for the future.

- Investigation is to be carried out more extensively on packaging of Gulabjamun mix for improving its shelf-life.

- Effort should be made to make maximum use of rice bran oil as it is bland in flavour, nutritious and cheap as compared to most of the other common cooking oils.

- Further detailed investigation is to be carried out in order to manufacture diabetic Gulabjamuns for diabetic patients so they can relish the taste of this popular delicacy.