

CONTENTS

List of contents

Name of chapter	Title	Page No
• Chapter 1	Introduction	1-4
• Chapter 2	Review of Literature	5-7
• Chapter 3	Materials and Methods	8-14
• Chapter 4	Results and Discussion	15-22
• Chapter 5	Summary and Conclusion	23
• Chapter 6	Bibliography	24

LIST OF FIGURE:

Fig. no:	Title	Page
Fig. 1.1	Rasogolla ball boiling in the sugar syrup	3
Fig. 2.1	Images of rasogolla balls before and after cooking in sugar syrup	5
Fig. 2.2	Flow chart for the preperation of diabetic and dietetic rasogolla	6
Fig. 3.1	Induction top plate (A), Refractometer (B), Thermocouple & Temperature indicator (C)	11
Fig. 3.2	Digital Camera (A), oven (B), Microtome (C)	12
Fig. 3.3	Microwave (A), Phase Contrast microscope Microscope (B), Unsteady State Heat Transfer Unit(C)	12
Fig. 3.4	Three pieces of chhana balls each having 10 gram of weight	13
Fig. 3.5	Images of cooking of chhana ball in boiling sugar solution using induction top plate	13
Fig. 3.6	Measurement of core temperature of rasogolla by using thermo-couple	16
Fig. 3.7	TPA measurement set-up	18
Fig. 4.1	comparision of measurment of volume of rasogolla by different methods	21
Fig. 4.2	$SD/10^3(\%)$ vs Time graph	22
Fig. 4.3	$\ln(S_{deq}/S_{deq}-SD)$ vs time graph of rasogolla	23
Fig. 4.4	$SD/10^3(\%)$ vs Squire root of time	23
Fig. 4.5	Plot of $\alpha_c = f(*t_e, red)$ for swelling of rasogolla ($\alpha_c = SD/SD_{eq}$)	24
Fig. 4.6	Swelling Ratio (R/R_0) vs Cooking Time(min)	24
Fig. 4.7	Core temperature vs time for 100° C cooking condition	25
Fig. 4.8	Core temperature vs Time graph for 80, 90, and 100° C cooking condition	25
Fig. 4.9	Core temperature vs Time graph for 80 degree	26
Fig.4.10	Core temperature vs Time graph for 90 degree	26
Fig.4.11	plot of α_c vs reduced time (Plot for the isothermal period)	26
Fig.4.12	Reduced Radius vs Time of Rosogolla cooked in water	27
Fig.4.13	Reduced Radius vs Time for rosogolla cooked in sugar syrup	27
Fig.4.14	Variation of expansion ratio with cooking time at experimental conditions of Table 4.1	28
Fig.4.15	Variation of expansion ratio with cooking time during cooking in wate	28
Fig.4.16	Variation of expansion ratio with cooking time during cooking in water	29
Fig.4.17	Variation of expansion ratio with cooking time during cooking in 55% sugar syrup	29
Fig.4.18	Expansion ratio with cooking time during cooking of chhana ball with 0% maida	30
Fig.4.19	Expansion ratio with cooking time during cooking of chhana ball with 2.5% maida	30
Fig.4.20	Expansion ratio with cooking time during cooking of chhana ball with 5% maida	31
Fig.4.21	3D Response surface for expansion ratio of rasogolla.	32
Fig.4.22	Swelling Ratio Vs Cooking Time Graph Of Rosogoll	33
Fig.4.23	Swelling Ratio Vs Cooking Time	33
Fig.4.24	Images of thin cross sectioned rasogolla under phase contrast microscope.(cross sectioning is done by microtome)	34
Fig.4.26	TPA graph of Rosogolla	35

LIST OF TABLES

Table No.	Title	Page
Table 3.1	List of Models	15
Table 3.2	Experimental layout based on CCRD face centered Design	17
Table 4.1	Experimental conditions corresponding to codings in Fig. 4.1	20
Table 4.2	Values of measured and predicted core temperature are shown.	25
Table 4.3	Expansion rate at the end of 30 minutes of cooking	31
Table. 4.4	Porosity Determination	35
Table 4.5	TPA value of Rosogolla	35