Chapter	Particulars	Page No.
1	Introduction	1-2
	Objectives	
2	Review of Literature	3-10
	2.1 Importance of Banana ("Bhim "Kol")	
	2.2 Value addition of fruit	
	2.3 Effect of Pre-treatment	
	2.4 Drying of banana	
	2.5 Shrinkage during drying	
	2.6 Colour change	
	2.7 Effect of pretreatment and drying on texture	
3	Material and Methods	11-19
	3.1 Materials:	
	3.2 Methology	
	3.3 Experimental procedure	
	3.4 Texture analysis	
	3.5 Hunter color Lab	
	3.6 Mathematical modeling of drying curves	
	3.7 Statistical Analysis	
4	Result and Discussions	20-40
	4.1 Pretreatment of banana slices	
	4.2 Effect of treatment on drying of banana slices.	
	4.3 Effect of pretreatment on colour change	
	4.4 Effect of pretreatment on texture	
	4.5 Effect of pretreatment on shrinkage	
	4.6 Modelling of hot air and vacuum drying of banana slices.	
	4.7 Statistical Analysis	
5	Summary and Conclusion	41-43
	Bibliography	44-45

i

List of Tables

Table	Title	Page
no		no
3.1	List of pretreatments with their respective codes	13
3.2	Experimental Plan	16
4.1	Initial moisture content of sample after treatment	20
4.2	Final moisture content of the banana slices after drying 50°C	23`
4.3	Total colour change of the banana slices after drying at 50°C	28
4.4	Total colour change of the banana slices after drying at 70°C	29
4.5	Total colour change of the banana slices after drying at 70°C (Vacuum)	29
4.6	Different textural properties of banana slice after drying at 50°C (hot air)	31
4.7	Different textural properties of banana slice after drying at 70°C (hot air)	31
4.8	Different textural properties of banana slice after drying at vacuum	31
4.9	Effect of shrinkage at various temperature 50°C, 70°C, and Vacuum (70°C)	35
4.10	Page's Model Coefficient with their statistical parameter for goodness of fit for different drying conditions	38
4.11	Diffusion Model Coefficient with their statistical parameter for goodness of fit for different drying conditions	39
4.12	Diffusivity coefficient for drying process	39
4.13	ANOVA for Drying Constant at 50°C	40
4.14	ANOVA for Drying Constant at 70°C	40
4.15	ANOVA for Drying Constant under vacuum	40

Figure No	Title	Page no
4.1(a)	Variation in moisture content with respect to time at different drying conditions for T0 treatment.	23
4.1(b)	Variation in moisture content with respect to time at different drying conditions for T1 treatment.	24
4.1 (c)	Variation in moisture content with respect to time at different drying conditions for T2 treatment.	24
4.1(d)	Variation in moisture content with respect to time at different drying conditions for T3 treatment	25
4.1(e)	Variation in moisture content with respect to time at different drying conditions for T4 treatment	25
4.1(f)	Variation in moisture content with respect to time at different drying conditions for T5 treatment	26
4.1(g)	Variation in moisture content with respect to time at different drying conditions for T6 treatment	26
4.1(h)	Variation in moisture content with respect to time at different drying conditions for T7 treatment	27
4.1(i)	Variation in moisture content with respect to time at different drying conditions for T8 treatment	27
4.2	Comparison of the total colour change of the banana slices after drying at 50°C, 70°C and vacuum	29
4.3(a)	Hardness of banana slice after drying at 50°C, 70°C, and Vacuum	32
4.3(b)	Adhesiveness of banana slice after drying at 50°C, 70°C, and Vacuum	32
4.3(c)	Springiness of banana slice after drying at 50°C, 70°C, and Vacuum	32
4.3(d)	Cohesiveness of banana slice after drying at 50°C, 70°C, and Vacuum	33
4.3(e)	Gumminess of banana slice after drying at 50°C, 70°C, and Vacuum	33
4.3(f)	Chewiness of banana slice after drying at 50°C, 70°C, and Vacuum	33
4.4	TPA plot of dried sample at 50°C	34
4.5	TPA plot of dried sample at 70°C	34
4.6	TPA plot of dried sample at 70°C under vacuum	35
4.7	Effect of shrinkage at various temperature 50°C, 70°C, and Vacuum (70°C)	36
4.8	Variation in moisture content with respect to time for different pretreatment at 50°C	37
4.9	Variation in moisture content with respect to time for different pretreatment at 70°C	37
4.10	Variation in moisture content with respect to time for different pretreatment at Vacuum	37

	Symbols	Meaning
	TO .	Control dried sample
	T1	Hot water blanched dried sample
	T2	Steam blanched dried sample
	T3	Acid treated dried sample
	T4	Sulphite treated dried sample
	T5	Freezing treatment dried sample
	T6	Blanching and freezing treatment dried sample
	T7	Ultrasonically treated dried sample
	T8	Blanching and Ultrasonically treated dried sample
,	MR	Moisture ratio
	\mathbb{R}^2	Correlation co-efficient
	M	Moisture content(g water/g of dry solids)
	Me	Equilibrium moisture content(g water/g of dry solids)
	M0	Initial moisture content(g water/g of dry solids)
	T	Time
	Exp	Exponential
	k,n	Empirical coefficient in models
	SSE	Sum of square error
	RMSE	Root mean square error
	A,b	Model coefficient
	Df	Denominator degree of freedom