

**THE EFFECT OF COOKING WITH MICROWAVE OVEN,
CONVECTION OVEN AND
GRILL ON THE QUALITY OF COOKED BEEF**


By

MARIATI MAT ISA

**Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Bachelor Of Science (Hons.) Food Quality Management
In the Faculty of Applied Science
Universiti Teknologi MARA**

April 2002

Final Year Thesis entitled "The effect of cooking with microwave oven, convection oven and grill on the quality of cooked beef" submitted by Mariati bt Mat Isa, in partial fulfillment of the requirements for the degree of Bachelor of Science (Hons.) Food Quality Management, in the Faculty of Applied Science, is approved by



(Cik Normah bt Ismail)
Supervisor

B.Sc (Hons) Food Quality Management Programme
Faculty of Applied Science
Universiti Teknologi MARA



Dr. Zainal Samicho

Head
B. Sc. (Hons) Food Quality
Management Programme
Faculty of Applied Science
Universiti Teknologi MARA



Assoc. Prof. Dr. Muhamad Rosli Sulaiman
Dean

Faculty of Applied Science
Universiti Teknologi MARA

Date: 4 JUN 2002

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim

In the name of Allah, The Beneficient, The Most Merciful and The Most Compassionate.

Thanks to Allah S.W.T for giving me strength and opportunity to do and complete this project successfully.

My deepest appreciation and thanks to my lovely supervisor, Miss Normah Ismail for his guidance, suggestion and supervision to enable me proceed this project continuously and successfully.

I would like to extend my appreciation to Dr. Zainal Samicho as the head of program of Degree in Food Quality Management, and all the Food Quality Management lecturers and also laboratory assistants, Mr. Omar, Mr. Osman, Mr. Azli for their supporting and helping.

I am grateful to the Microbiology Department School of Applied Science for permission to use the microbiology laboratory facilities, which made the project possible.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABSTRACT	x
ABSTRAK	xi
CHAPTER	
1 INTRODUCTION	1
2 LITERATURE REVIEW	3
2.1 Microwave Oven	3
2.2 Convection Oven	5
2.3 Grilling	5
2.4 Composition in Beef Meat Product	9
2.5 Nutrition in Meat	10
2.5.1 Protein	10
2.5.2 Fats	10
2.2.3 B Vitamins	11

ABSTRACT

THE EFFECT OF COOKING WITH MICROWAVE OVEN, CONVECTION OVEN AND GRILL ON THE QUALITY OF COOKED BEEF

The properties of microwave oven, convection oven and grill on the quality cooked beef were ascertained. The effect of different methods were determined in terms of physical and chemical analysis, microbiological test and sensory evaluation.

The formulations of roasted beef meat were prepared using raw beef meat, brown sugar, light soy sauce, orange juice, garlic, corn oil, ginger, black pepper and chilli powder. From the sensory evaluation test, it is found that the texture and colour of beef cooked by convection oven was significantly ($p < 0.05$) most preferred than those cooked by microwave oven and grilling method. However, in terms of overall acceptability, the beef cooked by grilling method was most preferred.

Chemical analysis was conducted on the formulations of roasted beef meat to determine the amount of moisture, fat, protein and ash by different methods of cooking. The statistical analysis showed that the beef cooked by grilling method contained lowest ($p > 0.05$) amount of protein and highest amount of ash and moisture content whereas beef cooked by microwave oven contained significantly lower ($p < 0.05$) fat content than those cooked by convection oven and grilling.

In microbiological test, Total Plate Count (TPC) and E. Coli were conducted in order to study the microorganism growth of cooked beef. The analysis showed that after the first 7 days there is no growth of microorganism whereby the number of colony was less than 30. In microbiological test of E. Coli showed that after first 7 days plate count on E. Coli remained similar that is no presence of E. Coli at minimum dilution 10^{-1} . Both of Total Plate Count (TPC) and E. Coli test were less than 30. The cooked beef meat are safe to be eaten.