

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT AND SENSORY EVALUATION
OF BROWNIES USING CAULIFLOWER
POWDER**

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ABSTRACT

The rising prevalence of non-communicable diseases (NCDs) in Malaysia (diabetes, and heart diseases) is linked to low dietary fibre intake, highlighting the need for innovative dietary strategies. One approach is incorporating cauliflower powder (CP) into brownies to boost fibre intake. This study aimed to develop brownies using CP as an alternative baking ingredient, determine their nutritional composition, and evaluate their sensory characteristics and overall acceptability. Nutritional analysis of cauliflower powder brownies (CPB) with varying CP percentages used several methods; oven drying method for moisture, dry ashing for ash content, the Kjeldahl method for protein content, Soxhlet extraction for fat, Nutritionist Pro for total dietary fibre, and the difference method for carbohydrate. A sensory evaluation with 36 untrained participants, using a 7-point Hedonic Scale assessed appearance, aroma, taste (aftertaste), texture (chewiness), and overall acceptance. The results showed that brownies with 10% CP (CPBD) were more accepted than those with lower CP concentrations and traditional brownies. CP improved all the sensory attributes, receiving the highest scores for appearance, aroma, taste, texture, and overall acceptability. Proximate analysis revealed that CPBD had higher levels of moisture, ash, protein, and dietary fibre, while having lower carbohydrate and fat contents. These findings suggest that CPB can effectively enhance dietary fibre intake in Malaysia, offering a promising strategy to combat NCDs through improved dietary choices.

Keywords: Non-communicable diseases (NCDs), dietary fibre, cauliflower powder (CP), sensory evaluation, proximate analysis.

TABLE OF CONTENTS

AUTHOR'S DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF PLATES	xi
LIST OF SYMBOLS	xii
LIST OF ABBREVIATIONS	xiv
LIST OF NOMENCLATURES	xvii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	3
1.3 Research Justification	4
1.4 Research Questions and Research Objectives	5
1.4.1 Research Questions	5
1.4.2 Research Objectives	6
CHAPTER TWO	7
LITERATURE REVIEW	7
2.1 Definition of Dietary Fibre	7
2.2 Recommended Fibre Intake in Malaysia	9
2.3 Trend of Dietary Fibre Intake in Malaysia	10
2.4 Health Benefits of Dietary Fibre	15
2.5 Introduction of Cauliflower	18
2.6 Health Benefits of Cauliflower	19
2.7 Cauliflower Waste	21
2.8 Cauliflower Powder (CP) Incorporated in Baked Goods	24
2.9 Introduction of Brownies	25
CHAPTER THREE	29

CHAPTER ONE

INTRODUCTION

1.1 Research Background

In recent years, there has been a growing awareness of the importance of dietary choices and their impact on health and well-being (Ridder et al., 2017). This is due to the non-communicable diseases (NCDs), such as heart disease, diabetes, and certain types of cancer, that have been on the rise globally, presenting a significant public health challenge, especially in Malaysia (Khaw et al., 2023; WHO, 2018). Data from the Noncommunicable Diseases Country Profiles 2014 by the World Health Organisation (WHO) (2014) reveal the stark reality of the NCD epidemic in Malaysia, NCDs were projected to be responsible for a staggering 73% of fatalities, making it a dominant health concern. Among these, cardiovascular diseases (CVDs) emerge as the major contributor contributing to 36% of the total NCD-related deaths. Additionally, 15% of NCD-related deaths were attributed to cancer, 7% to chronic respiratory disease, 3% to diabetes, and 12% to various other NCDs.

The severity of the situation becomes even more evident considering the data from the 2015 National Health and Morbidity Survey (NHMS) by the Institute for Public Health (IPH) (2015). In this survey, it was reported that approximately 3.5 million adults in Malaysia, representing 17.5% of the population, were diagnosed with diabetes. Hypertension affected 6.1 million individuals (30.3%), hypercholesterolaemia was prevalent in 9.6 million (47.7%), and obesity was observed in 3.3 million people (17.7%). Furthermore, WHO's updated statistics (2018) underscore the persistent rise in NCD-related fatalities in Malaysia. The percentage of deaths caused by NCDs increased to 74% in 2016, with the highest percentage of 35% credited to CVDs, 16% to cancers, 4% to chronic respiratory