

**COMPARATIVE STUDY OF THE YOGHURTS
PREPARED FROM COW MILK, BUFFALO MILK,
SOY MILK AND GOAT MILK**

BY

GUNARETNAMPILLAI JAYAPIRADHA



FAG357



Project Report
Library - EUSL

357

FACULTY OF AGRICULTURE

EASTERN UNIVERSITY

SRI LANKA

2013

PROCESSED

ABSTRACT

Yoghurt is a fermented and coagulated milk product with a smooth texture having mild sour taste and pleasant flavor. It is one of most important dairy product consumed throughout the world. The nutritional and health benefits of yoghurt are numerous. It is a good source of proteins, energy (calories), vitamins and minerals. Yoghurt has traditionally being made from animal milk especially cow milk. However, over the years, milk from other sources has been used to make yoghurt.

This study was conducted to assess the quality of yoghurts prepared from cow, buffalo, soy and goat milk. The four types of yoghurt samples were analyzed during the experiment. The parameters used to monitor the quality of yoghurt samples were Organoleptic (Colour, Aroma, Taste, Texture and Overall Acceptability) and Chemical (Titrable acidity, pH, Moisture, Ash, Lactose, Protein and Fat). Seven points hedonic scale ranking method was used to evaluate organoleptic characters. According to the results of the organoleptic parameters using Tukey's test, it was concluded that yoghurt prepared from cow milk superior than yoghurt prepared from buffalo, soy and goat milk. Nutritional point of view it was concluded that yoghurt made from buffalo, soy and goat milk was also good.

The yoghurt made from cow milk was stored for 4 weeks and analyzed for the change of nutritional parameters (Tirable acidity, pH, Moisture, Ash, Lactose, Protein and Fat) during the storage period. Quality parameters of yoghurt Vz-Titrable acidity, pH, Ash, Moisture, Lactose, Fat and Protein were significantly ($p < 0.05$) affected during the storage period.

Final study was conducted to compare the organoleptic quality of yoghurts prepared in this research study with the locally available yoghurt in the Batticaloa market. Eight

TABLE OF CONTENTS

	Page no.
ABSTRACT	i
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF PLATES	xiv
CHAPTER 01.INTRODUCTION	1
CHAPTER 02. LITERATURE VIEW	3
2.1 Milk	3
2.1.1 Definition of milk	3
2.1.2 Milk structure	3
2.1.3 Composition of milk	4
2.1.3.1 Water	5
2.1.3.2 Fat	5
2.1.3.3 Protein	7
2.1.3.4 Lactose	8
2.1.3.5 Minerals	9

2.1.3.6 Vitamins.....	10
2.1.3.7 Enzymes.....	10
2.1.4 Source of milk.....	11
2.1.4.1 Cow Milk.....	11
2.1.4.2 Buffalo milk.....	13
2.1.4.3 Goat milk.....	16
2.1.4.4 Soy milk.....	17
2.1.4.4.1 Benefits of soy milk.....	19
2.1.4.4.2 Nutritional values of the soy milk.....	21
2.1.5 Milk products.....	22
2.1.5.1 Condensed milk.....	22
2.1.5.2 Dried milk powder.....	23
2.1.5.3 Skimmed milk powder.....	24
2.1.5.4 Malted milk powder.....	24
2.1.5.5 Ice cream.....	24
2.1.5.6 Whey.....	25
2.1.5.7 Ghee.....	25
2.1.5.8 Milk paneer.....	26
2.1.5.9 Fermented milk and milk products.....	26
2.1.5.9.1 Acidophilus milk.....	27
2.1.5.9.2 Sour cream.....	27
2.1.5.9.3 Buttermilk.....	27
2.1.5.9.4 Concentrated fermented milks.....	28
2.1.5.9.5 Kefir (Kephir).....	28

2.1.5.9.6 Cheese.....	29
2.1.5.9.7 Butter	29
2.1.5.9.8 Curd	29
2.2 Yoghurt.....	30
2.2.1 History of yoghurt.....	31
2.2.2 Manufacturing process.....	32
2.2.3 The principal of yoghurt production.....	35
2.2.4 Important ingredients of yoghurt.....	36
2.2.4.1 Milk.....	36
2.2.4.2 Milk powder.....	36
2.2.4.3 Sweetening agents	36
2.2.4.4 Stabilizers / emulsifier	37
2.2.4.5 Flavouring agent	37
2.2.4.6 Colouring matter	39
2.2.4.7 Starter culture.....	39
2.2.5 Different types of yoghurts.....	39
2.2.5.1 Set yoghurt.....	40
2.2.5.2 Stirred yoghurt.....	40
2.2.5.3 Drinking yoghurt	40
2.2.5.4 Frozen yoghurt.....	40
2.2.5.5 Concentrated yoghurt	40
2.2.5.6 Flavoured yoghurt.....	41
2.2.6 Health benefits of yoghurt	41

2.3 Sensory evaluation	42
2.3.1 Tests used to achieve the objectives	43
2.3.1.1 Hedonic rating test.....	43
2.3.2 Qualities assessed by sensory tests	44
2.3.3 Benefits of using sensory evaluation	44
2.3.4. Problem associated with sensory evaluation	44
2.3.5 Rules of sensory evaluation	45
 CHAPTER 03. METERIALS AND METHODS	46
 3.1 Laboratory study	46
 3.2Collection of milk samples	46
 3.3 Preparation of different types of yoghurt	46
 3.4 Nutritional Analysis of Yoghurt	47
3.4.1 Determination of moisture content of yoghurt	47
3.4.2 Determination of ash content of yoghurt	48
3.4.3 Determination of acidity of yoghurt	48
3.4.4 Determination of lactose content of yoghurt	49
3.4.5 Determination of fat content in yoghurt by Gerber method	51
3.4.6 Determination of total protein	51
3.4.7 Statistical analysis.....	53
 3.5 Sensory Evaluations	53

3.5.1 Coding of samples	53
3.5.2 Preparing of sample for the panel testing.....	54
3.5.3 Instruction for the panelist	54
3.5.4 Evaluation of samples by the panelist	54
3.5.5 Statistical analysis.....	55
3.6 Storage studies	56
CHAPTER 04. RESULTS AND DISCUSSION.....	57
4.1 Nutritional analysis of yoghurt made from different milk samples.	57
4.1.1 Titrable acidity	59
4.1.2 pH.....	60
4.1.3 Moisture	61
4.1.4 Ash	62
4.1.5 Lactose	63
4.1.6 Protein	64
4.1.7 Fat	65
4.2 Sensory qualities of yoghurt prepared from cow milk, buffalo milk, soy milk and goat milk.....	66
4.2.1 Sensory evaluation of the samples.....	66
4.2.1.1 Colour	67
4.2.1.2 Aroma	68
4.2.1.3 Taste.....	69

4.2.1.4 Texture	71
4.2.1.5 Overall acceptability	72
4.3 Storage study	73
4.3.1 The effect of storage on chemical characteristic of cow milk yoghurt	73
4.3.1.1 Titrable acidity	74
4.3.1.2 pH	76
4.3.1.3 Moisture	77
4.3.1.4 Ash	78
4.3.1.5 Lactose	79
4.3.1.6 Protein	80
4.3.1.7 Fat	81
4.4 Organoleptic quality evaluation of yoghurt available in the Batticaloa	82
CHAPTER 05. SUMMARY AND CONCLUSION	85
REFERENCE	88
APPENDIX	I-XXVI