

**QUALITY COMPARISION AND ACCEPTABILITYOF FRUIT YOGHURT WITHDIFFERENT FRUIT JUICES**

**Tanbin Sultana**

**Roll No.: 0116/04**

**Registration No.: 00354**

**Session: 2016-2017**

**The thesis submitted in the partial fulfillment of the requirements for the degree of Masters of Science in Food Processing and Engineering**

**Department of Food Processing and Engineering**

**Faculty of Food Science and Technology**

**Chittagong Veterinary and Animal Sciences University**

**Chittagong-4225, Bangladesh**

**JUNE, 2018**

**Authorization**

I hereby declare that I am the sole author of the thesis. I also authorize the Chittagong Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize the CVASU to reproduce the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I, the undersigned, and author of this work, declare that the electronic copy of this thesis provided to the CVASU Library, is an accurate copy of the print thesis submitted, within the limits of the technology available.

**Tanbin Sultana**

**JUNE,2018**

**QUALITY COMPARISION AND ACCEPTABILITY OF FRUIT YOGHURT WITH DIFFERENT FRUIT JUICES**

**Tanbin Sultana**

**Roll No.: 0116/04**

**Registration No.: 00354**

**Session: 2016-2017**

**This is to certify that we have examined the above Master’s thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made**

**……………………………**

**(Shireen Akther)**

 **Supervisor**

**…………………………………………**

**(Shireen Akther)**

**Chairman of the Examination Committee**

**Department of Food Processing and Engineering**

**Faculty of Food Science and Technology**

**Chittagong Veterinary and Animal Sciences University**

**Khulshi, Chittagong-4225, Bangladesh**

**JUNE 2018**

Table of Contents

Title Pages

LIST OF TABLE…………………………………………………………………….VI

LIST OF FIGURE……………………………………………………………………VII

LIST OF ABBREBIATION………………………………………………………………......IX

ACKNOWLEDGEMENTS………………………………………………………….VIII

ABSTRACT……………………………………………………………………………………X

[CHAPTER: 1 **Error! Bookmark not defined.**](#_Toc519512339)

[INTRODUCTION](#_Toc519512340) 2

[1.1 Aim and Objectives of the study: 5](#_Toc519512341)

[1.2 Anticipated Outcomes:](#_Toc519512342) 5

[CHAPTER: 2](#_Toc519512343) 6

[REVIEW OF LITERATURE](#_Toc519512344) 7

[CHAPTER: 3](#_Toc519512345) 15

[MATERIALS AND METHODS](#_Toc519512346) 16

[3.1 Preparation of fruit yoghurts:](#_Toc519512347) 16

[3.1.1 Preparation of culture:](#_Toc519512348) 16

[3.1.2 Preparation of fruit juices (Strawberry, Orange and Mango)](#_Toc519512349) 16

[3.1.3 Preparation of plain yoghurt (control) and fruit (Strawberry, Orange and Mango) yoghurt](#_Toc519512350) 16

[3.2 Chemical analysis of fruit yoghurt](#_Toc519512351) 17

[3.2.1 Moisture content](#_Toc519512352) 17

[3.2.2 Ash](#_Toc519512353) 18

[3.2.3 Fat](#_Toc519512354) 18

[3.2.4 Protein](#_Toc519512355) 20

[3.2.5 Total carbohydrate](#_Toc519512356) 21

[3.2.6 Titratable acidity](#_Toc519512357) 21

[3.3 Sensory quality evaluation of fruit yoghurt](#_Toc519512358) 22

[3.4 Bacteriological Investigation](#_Toc519512359) 22

[3.4.1 Required apparatus:](#_Toc519512360) 22

[3.4.2 Reagents:](#_Toc519512361) 23

[3.4.3 Isolation of total viable count:](#_Toc519512362) 23

[3.4.4 Isolation of total coliform count:](#_Toc519512363) 23

[3.4.5 Isolation of yeast and mould count:](#_Toc519512364) 23

[CHAPTER: 4](#_Toc519512365) 24

[RESULTS: 5](#_Toc519512366) 25

[4.1 Comparison of chemical characteristics of fruit yoghurts](#_Toc519512367) 25

[4.1.1 Yoghurts with 5% fruit juice 25](#_Toc519512368)

[4.1.2 Yoghurts with 10% fruit juice](#_Toc519512369) 27

[4.1.3 Yoghurts with 15% fruit juice](#_Toc519512370) 28

[4.2 Comparison of physical characteristics of fruit yoghurts](#_Toc519512371) 29

[4.2.1 Yoghurts with 5% fruit juice](#_Toc519512372) 30

[4.2.2 Yoghurts with 10% fruit juice](#_Toc519512373) 30

[4.2.3 Yoghurts with 15% fruit juice](#_Toc519512374) 32

[4.3 Comparison of Microbiological characteristics of fruit yoghurts:](#_Toc519512375) 32

[4.3.1 Yoghurts with 5% fruit juice](#_Toc519512376) 33

[4.3.2 Yoghurts with 10% fruit juice](#_Toc519512377) 33

[4.3.3 Yoghurts with 15% fruit juice](#_Toc519512378) 34

[CHAPTER: 5](#_Toc519512379) 35

[DISCUSSION](#_Toc519512380) 36

[CHAPTER: 6](#_Toc519512381) 38

[CONCLUSIONS](#_Toc519512382) 39

[CHAPTER: 7:](#_Toc519512383) 40

[RECOMMENDATIONS AND FUTURE PERSPECTIVES](#_Toc519512384) 41

REFERENCES……………………………………………………………………….42

Appendix A: Photo gallery……………………………………………………….50

**List of Tables**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Title** | **Page No** |
| **Table4.1** | Effect of chemical characteristics on quality of plain and different types of fruit yoghurt with 5% fruit juice. | **25** |
| **Table4.2** | Effect of chemical characteristics on quality of plain and different types of fruit yoghurt with 10% fruit juice. | **26** |
| **Table4.3** | Effect of chemical characteristics on quality of plain and different types of fruit yoghurt with 15% fruit juice. | **29** |
| **Table4.4** | Effect of physical characteristics on quality of plain and different types of fruit yoghurt with 5% fruit juice. | **29** |
| **Table4.5** | Effect of physical characteristics on quality of plain and different types of fruit yoghurt with 10% fruit juice. | **30** |
| **Table4.6** | Effect of physical characteristics on quality of plain and different types of fruit yoghurt with 15% fruit juice. | **31** |
| **Table4.7** | Microbiological Quality of fruit yoghurts with 5% fruit juice. | **32** |
| **Table4.8** | Microbiological Quality of fruit yoghurts with 10% fruit juice. | **33** |
| **Table4.9** | Microbiological Quality of fruit yoghurts with 15% fruit juice. | **34** |

**List of Figures**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Title** | **Page No.** |
| Figure 4.1 | Comparison of Chemical Characteristics of 5% Fruit Yoghurts. | **26** |
| Figure 4.2 | Increasing of Acidity with Fruit Juice Concentration. | **27** |
| Figure 4.3 | Comparison of Ash Percentage on Different Types of Yoghurts. | **29** |
| Figure 4.4 | Comparison of Overall Acceptability on Different Types of Yoghurts. | **31** |

**Acknowledgements**

Firstly, I would like to express my cordial thanks to the Almighty Allah, whoenables me to finish off the research work for the degree of Master of Science (MS) in Food Processing and Engineering under the Department of Food Processing and Engineering, Chittagong Veterinary and Animal Sciences University (CVASU).

Secondly, I want to acknowledge my university Chittagong Veterinary and Animal Sciences University (CVASU) for giving me the opportunity and providing such research facilities. I like to give special thanks to my supervisor and Chairman of the Examination Committee Mrs**. Shireen Akther**for her kind approval and her sincere guidance, sympathetic supervision, valuable suggestions, constructive and constant inspiration throughout the entire period of the study to prepare the dissertation successfully.

I would also like to acknowledge the support, cooperation and encouragement received during my MS program from other teaching and technical and non-technical staffs of the Department of Food Processing, CVASU.

I like to give special thanks to the authority of Poultry Research and Training Center (PRTC) for providing all the lab facilities and other technical staffs of PRTC who supported during bacteriological investigation of samples. I sincerely thank to the Directorate of Research and Extension for giving me a research grant to accomplish my research work.

With great pleasure, I would like to express my deepest sense of gratitude, sincere appreciation, profound regards and immense indebtedness to my respected teacher friends and well-wisher for giving me mental support and encouragement during the MS research work.

I also expresses my heartfelt respects and thanks to my beloved parents and husband for their understanding, inspirations, moral support, kindness and blessings, forbearance and endless love to complete this study.

**The author**

**June, 2018**

**List of abbreviation**

|  |  |
| --- | --- |
| **Abbreviation** | **Elaboration** |
| % | Percentage |
| °C | Degree centigrade |
| CVASU | Chittagong Veterinary and Animal Sciences University |
| CFU | Colony forming unit |
| F.A.O | Food and Agricultural Organization |
| Gm | Gram |
| HCl | Hydrochloric acid |
| Hrs | Hours |
| LAB | Lactic acid bacteria |
| Log | Logarithm |
| Mg | Milligram |
| Ml | Milliliter |
| N | Normality |
| PRTC | Poultry Research and Training Center |
| SLSI | Sri Lanka Standards Institute |
| TVC | Total viable Count |
| USA | United States of America |
| USDA | United States Department of Agriculture |
| W | Weight |
| W.H.O | World Health Organization |

**Abstract**

This study was carried out to develop and evaluate physicochemical property, microbial quality and sensory acceptance of fruit yoghurt and plain yoghurt. Fruit yoghurt with three different fruit juice types: strawberry, mango and orange were prepared with different proportions. Each of the fruit juices were added to yoghurt at the rate of 5%, 10%, 15%. Fruit yoghurt and plain samples (no fruit juice added) were analyzed for physicochemical and microbial quality and sensorial acceptance.Quality of the yoghurts was improved due to incorporation of low level of fruit juice. Yoghurts fortified with 10% orange juice was the best in quality among the others. The smell and taste, body and consistency and color and texture of the fruit yoghurts were equally acceptable. 10 and 15% strawberry fruit yoghurt contain more acid and its texture was cracked down in refrigeration temperature. The moisture and acidity content of fruit yoghurts were increased than plain yoghurt because of high content of these in the fruits. The fat, protein content of strawberry and orange fruit yoghurt were decreased than normal plain yoghurt. But the carbohydrates content of fruit yoghurt were increased because fruit contains more sugar than milk. Statistical analysis showed that yoghurt fortified with 10% orange juice was more acceptable than others comparing all quality characteristics. The microbiological quality of the fruit yoghurts was also acceptable because of acid content of the fruits. In case of strawberry yoghurt, fruit juice concentration more than 5% was not suitable for fruit yoghurt because that are highly acidic and curd was cracked down at refrigerated condition. The findings of this research may give an overall idea about manufacturing of fruit yoghurt incorporating different level of fruit juice and appropriate technology of fruit yoghurt preparation.The results of current study confirm that, addition of fruit juice to the yoghurt significantly improved the sensorial acceptability and physicochemical properties of yoghurt.

**Keywords**: Fruit yoghurt, Fruit juices, Acceptability, Microbial quality, Sensory quality, chemical properties.