

## TABLE OF CONTENTS

<b>THESIS COVER</b> .....	<b>i</b>
<b>LEGALIZATION SHEET</b> .....	<b>ii</b>
<b>FOREWORDS</b> .....	<b>iv</b>
<b>TABLE OF CONTENTS</b> .....	<b>vi</b>
<b>LIST OF TABLES</b> .....	<b>vii</b>
<b>LIST OF FIGURES</b> .....	<b>viii</b>
<b>LIST OF APPENDIXES</b> .....	<b>ix</b>
<b>ABSTRACT</b> .....	<b>x</b>
<b>CHAPTER I INTRODUCTION</b> .....	<b>1</b>
1.1. Background .....	1
1.2. Problem Statement.....	4
1.3. Objectives .....	4
1.4. Research Benefits .....	5
<b>CHAPTER II LITERATURE REVIEW</b> .....	<b>6</b>
2.1. Goat Milk.....	6
2.2. Semi-Soft Cheese .....	9
2.3. Probiotic Cheese.....	13
2.4. <i>Lactiplantibacillus plantarum</i> subsp. <i>plantarum</i> Dad-13.....	16
2.5. Anti-Inflammatory Potential of Fermented Dairy Product .....	18
2.6. Hipotesis .....	23
<b>CHAPTER III MATERIAL AND METHOD</b> .....	<b>25</b>
3.1. Time and Place of Research .....	25
3.2. Materials.....	25
3.3. Research Methods.....	27
<b>CHAPTER IV RESULT AND DISCUSSION</b> .....	<b>36</b>
4.1. Effect of Starter Culture on pH and Duration of Cheesemaking.....	36
4.2. Cheese Yield and Proximate Composition Analysis .....	38
4.3. Cell Viability.....	39
4.4. Anti-Inflammatory Activities.....	42
4.5. Molecular Mechanism .....	54
<b>CHAPTER V CONCLUSION AND SUGGESTION</b> .....	<b>63</b>
5.1. Conclusion .....	63
5.2. Suggestion.....	64

## LIST OF TABLES

Table 2.1	Comparison of Mammalian Milk Composition . . . . .	7
Table 4.1	Chemical composition of goat cheese sample. . . . .	37

## LIST OF FIGURES

Figure 2.1	<i>Crottin de Chavignol</i> .....	9
Figure 2.2	Molecular mechanism of bioactives substances.....	21
Figure 3.1	Experimental stages flowchart .....	26
Figure 3.1	Cheesemaking process flowchart. ....	27
Figure 4.1	Reduction of pH during the cheesemaking process. ....	35
Figure 4.2	Cheesemaking process versus time .....	37
Figure 4.3	Survivability of LAB during aging.....	39
Figure 4.4	Sample semi-soft goat cheese water extract classification.....	41
Figure 4.5	RAW264.7 cells viability .....	42
Figure 4.6	Effect of semi-soft goat cheese on cytokines production.....	44
Figure 4.7	Effect of CID and CIF on IL-6 production.....	45
Figure 4.8	Effect of CID and CRD on IL-6 production.....	46
Figure 4.9	Effect of goat milk and cheese on IL-6 production.....	48
Figure 4.10	Effect of dialysis and fractionation on IL-6 production .....	49
Figure 4.11	Effect of proteinase K treatment on IL-6 production.....	50
Figure 4.12	Effect of GCD on mRNA expression of IL-6 and TNF- $\alpha$ .....	53
Figure 4.13	Effect of semi-soft goat cheese on IL-6 gene expression.....	54
Figure 4.14	Effect of semi-soft goat cheese on NO production. ....	56
Figure 4.15	Effect of semi-soft goat cheese on iNOS gene expression .....	57
Figure 4.16	Effect of semi-soft goat cheese on NF- $\kappa$ B .....	59
Figure 4.17	Effect of semi-soft goat cheese on MAPK. ....	60

## LIST OF APPENDIXES

1. pH reduction during cheesemaking .....	69
2. Cheesemaking Time (hours) .....	69
3. BAL Cells Counts GCD (Dad13-11) .....	69
4. BAL Cells Counts GCF (Flora Danica .....	71
5. Lactiplantibacillus plantarum Cells Counts (GCD) .....	73
6. RAW264.7 Cells Viability (WST-8).....	74
7. IL-6 Production .....	74
8. TNF- $\alpha$ Production .....	74
9. Dialysis Treatment IL-6 Production.....	75
10. Fractionation Treatment IL-6 Production .....	75
11. Proteinase K Treatment IL-6 Production .....	75
12. RT-PCR Cytokines.....	76
13. NO Production .....	76
14. RT-PCR iNOS.....	77
15. Immunoblot Analysis .....	77