CONTENTS

	Page
	Number
1. INTRODUCTION	1
2 . REVIEW OF LITERATURE	3
2.1 Non-Genetic Aspects	3 3 3 7
2.1.1 Age at First Calving	3
2.1.1.1 Means and variation	3
2.1.1.2 Year of birth effect	7
2.1.1.3 Season of birth effect	7
2.1.2 Longevity Traits	9
2.1.2.1 Means and variation	11
2.12.2 Year of birth effect	13
2.1.2.3 Season of birth effect	13
2.1.2.4 Age at first calving effect	14
2.1.2.5 First lactation milk yield effect	16
2.1.3 Lifetime Milk Production Traits	18
2.1.3.1 Means and variation	19
2.1.3.2 Year of birth effect	20
2.1.3.3 Age at first calving effect	21
2.1.3.4 First lactation milk yield effect	22
2.2 Genetic Aspects	25
2.2.1 Sire effect	25
2.2.2 Heritability estimates	25
2.2.3 Phenotypic and genetic correlations	30
3. MATERIAL AND METHODS	37
3.1 Location and Period	37
3.2 Animals and Breeding Plan	37
3.3 Housing, Feeding and Management	37
3.4 Data and Statistcal Analyses	39
3.5 Estimation of Genetic Parameters	45
4 . RESULTS AND DISCUSSION	48
4.1 Non – Genetic Aspects	48
4.1.1 Age at First Calving	48
4.1.1.1 Means and variation	48
4.1.1.2 Year of birth effect	49
4.1.1.3 Season of birth effect	50
4.1.1.4 Year of birth x Season of birth interaction	
effect	52

4.1.2 Longevity Traits	53
4.1.2.1 Means and variation	53
4.1.2.2 Year of birth effect	55
4.1.2.3 Season of birth effect	55
4.1.2.4 Year of birth x Season of birth interaction	
effect	58
4.1.2.5 Age at first calving effect	58
4.1.2.6 First lactation milk yield effect	60
4.1.3 Lifetime Milk Production Traits	63
4.1.3.1 Means and variation	63
4.1.3.2 Year of birth effect	66
4.1.3.3 Season of birth effect	67
4.1.3.4 Year of birth x Season of birth interaction	
effect	69
4.1.3.5 Age at first calving effect	73
4.1.3.6 First lactation milk yield effect	74
4.2 Genetic Aspects	77
4.2.1 Sire effect	77
4.2.2 Sire component of variance	77
4.2.3 Sire heritability estimates	81
4.2.4 Phenotypic and genetic correlation coefficients	83
5 . CONCLUSIONS	91
6. SUMMARY	93
7. REFERENCES	97
8. APPENDICES	122
9 . ARABIC SUMMARY	