



TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES.....	viii
LISTS OF ACRONYMS/ ABBREVIATIONS	ix
CHAPTER 1: General introduction	1
1.1. Background and research objectives	1
1.2. Overall framework of the study	6
1.3. Structure of the thesis	8
1.4. References	8
CHAPTER 2: Contribution of milking cows to smallholder crop-livestock production systems of Ethiopia depending on cattle management and performance	13
2.1. Introduction	15
2.2. Methodology	18
2.2.1. Study area	18
2.2.2. Household selection and data collection	21
2.2.3. Data analysis	22
2.3. Results	23
2.3.1. Farm endowments by smallholder farmers	23
2.3.2. Cattle production and management practices.....	26
2.3.3. Performance of milking cows	27
2.3.4. Contributions of cattle to the mixed farming system	33
2.4. Discussion	37
2.4.1. Characteristics of the production system	37
2.4.2. Implications of resource base and management on performance of milking cows	38
2.4.3. Implications of management and performance on the contributions of cattle	40
2.5. Conclusions	42
2.6. References	43



CHAPTER 3: Perceived and actual contributions of cattle and of dairy products to the cash income of smallholder farmers in the mixed production system of Ethiopia.....	49
3.1. Introduction	52
3.2. Material and methods	54
3.2.1. Description of the study area.....	54
3.2.2. Sampling framework and data collection.....	54
3.2.3. Data analysis	55
3.3. Results	60
3.3.1. Socioeconomic characteristics of smallholder farmers	60
3.3.2. Is farm endowment a key factor for cash income disparities?	61
3.3.3. Determinants of stated cattle keeping objectives	63
3.3.4. Determinants of market participation and income contribution from milk and dairy products	68
3.4. Discussion	70
3.5. Conclusions	75
3.6. References	76
CHAPTER 4: Assessing the relative importance of dairy products to family nutrition in mixed crop-livestock production systems of Ethiopia	81
4.1. Introduction	83
4.2. Material and methods	86
4.2.1. Study area	86
4.2.2. Household sampling and data collection.....	86
4.2.3. Data analysis	88
4.3. Results	91
4.3.1. Socio-economic characteristics of the sampled farm households	91
4.3.2. Household dietary diversity and contribution of ASF	93
4.3.3. Share of household expenditures for agricultural inputs, food and non-food items	97
4.3.4. Anthropometric indices of children.....	99
4.4. Discussion	103
4.5. Conclusion.....	107
4.6. Reference.....	108



CHAPTER 5: General discussion	117
5.1. Cattle production in mixed crop-livestock systems	117
5.2. Performance of milking cows under smallholder conditions	121
5.3. Contributions of cattle: services, income and family nutrition	123
5.3.1. Services	124
5.3.2. Income	128
5.3.3. Family nutrition	130
5.4. Potentials and limitations of research methodologies	133
5.5. References	138
CHAPTER 6: General conclusion.....	147
CHAPTER 7: General summary	149
7.1. General summary	149
7.2. Zusammenfassung	152