

Index

Preface.....	I
Summary.....	II
Zusammenfassung.....	V
Acknowledgement.....	VIII
Index.....	IX
Alphabetical list of abbreviations and symbols.....	XI
List of figures.....	XII
List of tables.....	XIII
1 Introduction.....	1
1.1 Problem statement and research questions.....	1
1.2 Thesis structure and objectives.....	4
2 Theoretical background and literature review.....	8
2.1 Operating principle of near infrared spectroscopy.....	8
2.2 Measurement modes in NIR spectroscopy.....	9
2.3 Chemometrics.....	10
2.4 Development of NIR prediction models.....	11
2.5 NIR applications for agricultural and horticultural products.....	12
2.6 Transition from stationary laboratory instruments to portable and miniaturized NIR sensors.....	16
2.7 Exploring the potential of food-scanners using tomato as model fruit.....	25
3 Food-scanners as a radical innovation in German Fresh Produce Supply Chains.....	28
4 Non-destructive measurement method for a fast quality evaluation of fruit and vegetables by using food-scanner.....	55
5 Evaluating the practicability of commercial food-scanners for non-destructive quality assessment of tomato fruit.....	62
6 Determination of tomato quality attributes using portable NIR-sensors.....	92
7 Comparison of colorimeter and different portable food-scanners for non-destructive prediction of lycopene content in tomato fruit.....	105
8 Food-scanner applications in the fruit and vegetable sector.....	128
9 Conclusion and future prospects.....	145

9.1 Corroboration of hypotheses	145
9.2 Additional findings and recommendations	152
9.3 Future prospects	156
9.4 Scientific and practical contribution	158
10 Declaration	160
11 References	161
12 Appendix	183