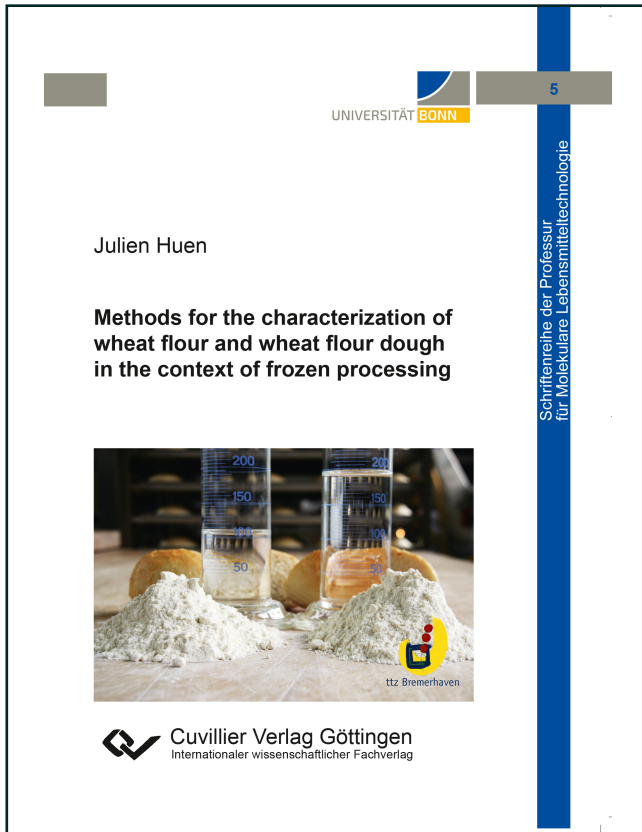




Julien Huen (Autor)

# Methods for the characterization of wheat flour and wheat flour dough in the context of frozen processing



<https://cuvillier.de/de/shop/publications/7928>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen, Germany

Telefon: +49 (0)551 54724-0, E-Mail: [info@cuvillier.de](mailto:info@cuvillier.de), Website: <https://cuvillier.de>



## Table of contents

Preliminary remarks.....	6
List of abbreviations .....	6
List of publications.....	7
Conferences.....	8
Declaration of contribution as co-author.....	10
Chapter 1 – General introduction .....	11
The worldwide bread market.....	11
Modern bread-making processes – use of deep-cooling.....	12
Wheat flour composition and characterization .....	15
From flour to bread dough.....	16
Quality attributes of bread .....	17
Conditions of freezing, frozen storage and thawing .....	17
Phenomena occurring in bread dough during freezing, frozen storage and thawing .....	18
Reduction of deep-cooling damage in bakery products .....	20
Raman spectroscopy and its use in confocal microscopy .....	21
Aims of the thesis.....	23
References.....	24
Chapter 2 – Confocal Raman microscopy of frozen bread dough .....	29
Abstract.....	29
Keywords .....	29
Introduction .....	30
Experimental .....	32
Results .....	35
Discussion.....	41
Conclusions .....	43
References.....	44



Chapter 3 – Wheat flour quality evaluation from the baker's perspective: comparative assessment of 18 analytical methods.....	47
Abstract.....	47
Keywords .....	47
Introduction .....	48
Experimental.....	50
Results .....	54
Discussion.....	59
Conclusions .....	62
References.....	63
Chapter 4 – Pilot scale investigation of the relationship between baked good properties and wheat flour analytical values.....	67
Abstract.....	67
Keywords .....	67
Introduction .....	68
Experimental.....	69
Results and discussion .....	71
Conclusions .....	81
References.....	83
Chapter 5 – Concluding remarks.....	85
Microstructure of frozen dough .....	85
Further possible developments and refinements of the microscopy method.....	86
Further potential applications of the (cryo) Raman microscopy in food science.....	89
Impact of fermentation interruption on the quality of rolls.....	90
Selecting analytical methods for flour specification.....	90
Interpretation in the light of the microscopy results .....	92
Potential utilization of the presented results.....	92
Outlook / potential for further research.....	93



Outlook / potential for further industry developments.....	93
References.....	95
Summary.....	97
Zusammenfassung.....	98
Acknowledgements.....	101