



Verena Bongartz (Autor)

Characterization of selected Polyphenol-Protein Interaction Products in alkaline-treated Sunflower Meal



<https://cuvillier.de/de/shop/publications/8203>

Copyright:

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

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



Table of Contents

Chapter 1: General Introduction	1
1 The sunflower (<i>Helianthus annuus</i> L)	1
1.1 Origin and proliferation	1
1.2 Botanic characteristics	2
1.3 Oil production	2
2 Solvent-extracted sunflower meal	5
2.1 Composition	6
2.2 Protein	6
2.3 Phenolic content	7
3 Polyphenols	9
3.1 General overview	9
3.2 Chlorogenic acid in SEM	11
4 Polyphenol-protein interactions	13
4.1 Non-covalent interactions	16
4.2 Covalent interactions	17
5 Trihydroxy benzacridine derivates	21
6 Aim	22
Chapter 2: Protection of protein from ruminal degradation by alkali-induced oxidation of chlorogenic acid in sunflower meal	31
1 Introduction	33
2 Materials and methods	35
2.1 Alkali treatment of sunflower meal	35
2.2 Chemical analysis	35
2.3 Crude protein fractionation and estimation of ruminally undegraded crude protein	36
2.4 Intestinal digestibility of ruminally undegraded crude protein	37
2.5 Data treatment and statistical analysis	38
3 Results	39
3.1 Chemical composition	39
3.2 Color development	39
3.3 Statistical relationships	39
3.4 Crude protein fractions	40
3.5 Ruminally undegraded crude protein	41



3.6	Optimization and verification of predictive models	42
3.7	Estimation of intestinal digestibility	43
4	Discussion	45
5	Conclusion	48
Chapter 3:	Evidence for the Formation of Benzacridine Derivatives in Alkaline-Treated Sunflower Meal and Model Solutions	53
1	Introduction	54
2	Results and Discussion	56
2.1	Color Development in SEM Extract and Model Solutions.....	56
2.2	UHPLC-DAD-MS/MS Analysis	58
3	Experimental Section	65
3.1	Plant Material	65
3.2	Chemicals and Reagents	65
3.3	UHPLC-DAD-MS/MS	66
4	Conclusions	68
Chapter 4:	Concluding remarks	71
	List of abbreviations	81
	Summary	83
	Zusammenfassung	85