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Preparation of lentil and quinoa protein complexes through protein-protein interactions and water kefir-assisted fermentation to improve protein quality and functionality

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Introduction: Industrial applications of lentil (LP) and quinoa (QP) proteins are limited due to their relatively poor water solubility. In this study, a combination of protein-protein interaction (PPI) and fermentation was used to improve the functionality and nutritional value of LP by conjugating them with QP. The reaction conditions between LP and QP for producing these conjugates were established.

Methods: The ratio of LP to QP was equal (50:50), and complexation was carried out at 25°C for 60 min. Fermentation of the solubilized LP-QP complexes (1%, w/v) for 5 days at 25°C with water kefir (5%, v/v) was carried out to enhance the protein quality and functionality of the LP-QP complexes.

Results: The combined technique significantly enhanced protein digestibility, decreased the proportion of α -helices in the protein structure in favor of random coil components, and improved the phenolic content of the LP-QP complexes. Digestibility increased to 87%, up from 76% for unfermented LP-QP. Moreover, the LP-QP complexes produced using the combined technique generated a highly nutritional protein with a reduced saponin content.

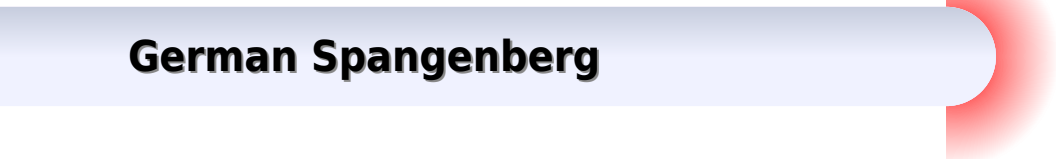
Conclusion: This research revealed that a combination of PPI and water kefir fermentation significantly enhances the nutritional and functional quality of LP, creating new opportunities for leveraging the growing popularity of plant-based proteins into high-value industrial applications.

KEYWORDS

lentil protein, quinoa protein, protein digestibility, water kefir fermentation, phenolic compounds

Opportunities To Improve Protein Quality And Quant

German Spangenberg



Opportunities To Improve Protein Quality And Quant:

Proceedings of the ... Rice Technical Working Group Rice Technical Working Group,1972 *Molecular Breeding of Forage Crops* German Spangenberg,2013-04-17 Forage plant breeding has entered the genome era This timely book reviews the latest advances in the development and application of molecular technologies which supplement conventional breeding efforts for our major forage crops It describes the plethora of new technologies and tools now available for high throughput gene discovery genome wide gene expression analysis production of transgenic plants genome analysis and marker assisted selection as applied to forage plants Detailed accounts are presented of current and future opportunities for innovative applications of these molecular tools and technologies in the identification functional characterisation and use of valuable genes in forage production systems and beyond This book represents a valuable resource for plant breeders geneticists and molecular biologists and will be of particular relevance to advanced undergraduates postgraduates and researchers with an interest in forage legumes and grasses

Quantitative Traits Breeding for Multifunctional Grasslands and Turf Dejan Sokolović,Christian Huyghe,Jasmina Radović,2014-09-12 Grasslands are among the largest ecosystems in the world and consequently are of great importance to mankind The genotypes of the species which are the main components of the grasslands have great influence on total outcome and successful utilization of grasslands Therefore fodder crops and turf swards should be constantly improved to follow modern trends in agriculture production and landscape architecture The wide range of breeding programs for forage and amenity species as well as new breeding methods and techniques is rapidly expanding the boundaries and is making it possible to achieve outstanding breeding results This book includes papers presented at the 30th EUCARPIA Fodder Crops and Amenity Grasses Section Meeting The challenging title of the book focuses on breeding of quantitative traits which directly impact the profitability and sustainability of grasslands and fodder crops production as well as on multidisciplinary approach in grassland research and utilisation Included papers offer a unique collection of ideas and breakthroughs in the fields of fodder crops and amenity grasses breeding and genetics as well as in the creative and innovative application of new tools in practical breeding

Achieving sustainable cultivation of maize
Volume 1 Dr Dave Watson,2017-06-09 Reviews key challenges and advances in maize breeding methods Discusses the development of varieties with enhanced nutritional and other properties such as improved protein content and abiotic stress resistance Summarises key steps being taken to support smallholders growing maize in developing countries

Legume Crops Mirza Hasanuzzaman,2020-10-21 In a sustainable agricultural system legume crops are one of the essential components However improving the productivity of legume crops and improving their tolerance to adverse environments are essential tasks for plant biologists This book includes nine comprehensive chapters addressing various aspects of legume crop biology production and importance There are several chapters on the adaptation of legumes to an adverse environment Particular focus is provided on the sustainable production of legume crops under changing environments This book will be

useful for undergraduate and graduate students teachers and researchers particularly from the field of Crop Science Soil Science Plant Breeding and Agronomy Department of Agriculture and Related Agencies Appropriations for Fiscal Year 1971 United States. Congress. Senate. Committee on Appropriations,1970 **Department of Agriculture and Related Agencies Appropriations** United States. Congress. Senate. Committee on Appropriations,1971 Department of Agriculture and Related Agencies Appropriations for Fiscal Year 1971 United States. Congress. House. Committee on Appropriations. Subcommittee on Agriculture--Environmental and Consumer Protection Appropriations,1970

Quantitative Methods for Food Safety and Quality in the Vegetable Industry Fernando Pérez-Rodríguez, Panagiotis Skandamis, Vasilis Valdramidis, 2018-02-06 This book focuses on the food safety challenges in the vegetable industry from primary production to consumption It describes existing and innovative quantitative methods that could be applied to the vegetable industry for food safety and quality and suggests ways in which such methods can be applied for risk assessment Examples of application of food safety objectives and other risk metrics for microbial risk management in the vegetable industry are presented The work also introduces readers to new preservation and packaging methods advanced oxidative processes AOPs for disinfection product shelf life determination methods and rapid analytic methods for quality assessment based on chemometrics applications thus providing a quantitative basis for the most important aspects concerning safety and quality in the vegetable sector Specialty Corns Arnel R. Hallauer, 2000-08-23 Completely revised and updated the Second Edition of Specialty Corns includes everything in the first edition and more Considered the standard in this field significant changes have been made to keep all the information current and bring the references up to date Two new chapters have been added to keep up with the latest trends Blue Corn and

Unveiling the Energy of Verbal Beauty: An Mental Sojourn through **Opportunities To Improve Protein Quality And Quant**

In a world inundated with screens and the cacophony of quick transmission, the profound energy and emotional resonance of verbal artistry usually fade in to obscurity, eclipsed by the regular barrage of sound and distractions. Yet, situated within the lyrical pages of **Opportunities To Improve Protein Quality And Quant**, a fascinating perform of fictional brilliance that pulses with raw emotions, lies an remarkable trip waiting to be embarked upon. Penned by a virtuoso wordsmith, this enchanting opus instructions viewers on a psychological odyssey, softly exposing the latent possible and profound affect stuck within the delicate internet of language. Within the heart-wrenching expanse of the evocative evaluation, we shall embark upon an introspective exploration of the book is main styles, dissect their captivating publishing style, and immerse ourselves in the indelible effect it leaves upon the depths of readers souls.

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