

**Important notes:**

Do **NOT** write outside the grey boxes. Any text or images outside the boxes **will** be deleted.

Do **NOT** alter the structure of this form. Simply enter your information into the boxes. The form will be automatically processed – if you alter its structure your submission will not be processed correctly.

Do not include keywords – you can add them when you submit the abstract online.

**Title:**

**Modulating Structure and Gelation Properties of Mung Bean Protein via  
Controlled Enzymatic Hydrolysis**

**Authors & affiliations:**

*Yusi Qin, Zhi Yang, Debashree Roy, Aiqian Ye*

*Riddet Institute, Massey University, New Zealand.*

**Abstract:** (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text into it.)

**Preparation of Your Abstract**

1. The title should be as brief as possible but long enough to indicate clearly the nature of the study. Capitalise the first letter of the first word **ONLY** (place names excluded). No full stop at the end.

2. Abstracts should state briefly and clearly the purpose, methods, results and conclusions of the work.

Introduction: Clearly state the purpose of the abstract

Methods: Describe your selection of observations or experimental subjects clearly

Results: Present your results in a logical sequence

Discussion: Emphasize new and important aspects of the study and conclusions that are drawn from them

The limited functional properties of plant proteins, such as gelation, restrict their application in food formulation. Mung bean protein, as an underestimated but high-quality plant protein, is no exception. Mung bean protein contains up to 55% vicilin, a protein lacking disulfide bonds, which results in poor gelation properties. This study systematically investigated how limited Alcalase hydrolysis promotes heat-induced gel formation of mung bean protein and its effects on the rheological properties and microstructure of the gels. A 10% (w/w) mung bean protein isolate (MPI) solution was enzymatically treated for varying durations and then heated at 90 °C for 30 min to terminate enzymatic hydrolysis and induce gel formation. Secondary structural analysis of the hydrolysates indicated that enzymatic hydrolysis induced a transition of MPI from an ordered conformation to a more disordered state, accompanied by a decreased surface hydrophobicity. The analysis of heat-induced gelation showed that only the samples hydrolyzed for 1 and 3 min (degree of hydrolysis of 1.26 % and 2.48 %) formed gels with elastic and solid-state characteristics, whereas the unhydrolyzed sample and the samples hydrolysed for longer time (> 3 min, degree of hydrolysis > 2.48 %) did not form gels. Confocal laser scanning microscopy revealed that short-time hydrolyzed samples formed dense and homogeneous gel network structures, while extra-hydrolysis led to small, dispersed protein particles and a loose gel structure. Additionally, short-time enzymatic hydrolysis significantly enhanced the elasticity, strength, and water-holding capacity of the gels. This study provides a theoretical basis for processing plant proteins under mild conditions to construct gels with desirable structures and offers new insights into the high-value application of mung bean protein in food.