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Title:

***In vitro* digestion behaviour and *in vivo* true ileal amino acid digestibility of high moisture extruded meat analogues**

Authors & affiliations:

Name and surname Institution/ Department, University, Country
Hao Cui, Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand
Debashree Roy, Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand
Siqi Li, Fonterra Research and Development Centre, Dairy Farm Road, 22 Palmerston North, New Zealand.
Qing Guo, College of Food Science and Nutritional Engineering, China Agricultural University, Beijing 100083, China
Suzanne M Hodgkinson, Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand
Natascha Stroebinger, Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand
Aiqian Ye, Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New Zealand

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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

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Introduction: As demand grows for sustainable and nutritious alternatives to animal protein, plant-based meat analogues (MA) have gained attention. However, their digestion and nutrient absorption remain poorly understood, even though these factors, together with nutritional composition, ultimately influence nutritional quality. The study evaluated *in vitro* digestion behavior and *in vivo* true ileal protein and amino acid digestibility of high moisture extruded meat analogues.
Methods: MA (57% moisture) were produced by extruding blends of air-classified quinoa flour (QF; 25% protein) and pea protein isolate (PPI; 80% protein), with QF levels up to 20%. Texture and microstructure of MA were evaluated using a texture analyser and scanning electron microscopy, respectively. *In vitro* gastric digestion behaviour of MA (cooked chicken meat as control) was evaluated using a human gastric simulator. *In vivo* true ileal protein and amino acid digestibility of MA was determined using the growing pig model.
Results: Increasing QF content in PPI-based MA reduced textural hardness, cohesiveness, and chewiness, and shifted the microstructure towards a looser, more porous network. Under *in vitro* gastric conditions, MA with higher QF disintegrated faster than MA without QF incorporation, primarily due to its looser structure. Fragmentation was identified as the main disintegration mechanism of MA in gastric phase, whereas cooked chicken meat underwent both surface erosion and fragmentation. MA with 20% QF incorporation showed a high true ileal digestibility of crude protein (91.9%) and indispensable amino acids (94.9%), which are comparable to values reported for animal proteins and high-quality plant proteins.
Conclusion: Microstructure drives the in vitro digestion behavior of meat analogues; with a loose and porous microstructure leading to fast gastric disintegration. *In vivo* findings showed that high moisture extruded meat analogues can be considered to be good quality dietary protein sources.