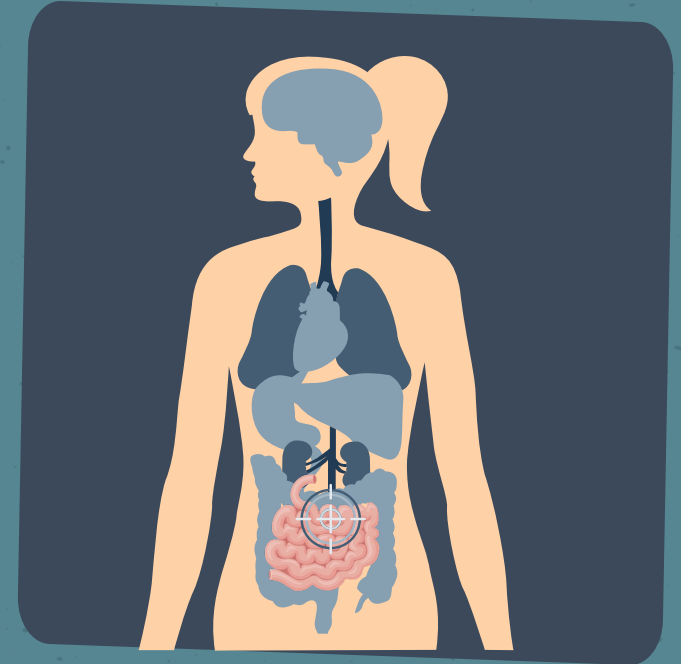


Survival of Intact Bovine Whey Proteins & Release of Whey-Derived Bioactive Peptides Across Adult GI tract

Suwimon (Noom) Sutantawong



A Little Bit About Me



Hometown

Roi-Et, Thailand



B.S in Food Science –OSU

Sponsored by the Thai government



R&D Product Development

Developed frozen cooked chicken & plant-based products for 4 years



M.S in Food Science –OSU

Currently a 1st year student



Future Plan: R&D Product Development in Dairy!



Bioactivities of Whey Proteins



Bioactivities

Enhance mineral absorption

- Lactoferrin,
- α -lactalbumin

Antimicrobial & anti-viral actions

- Lactoferrin
- Lysozyme
- Peroxidase
- Immunoglobulin
- Mucin

Prevent pathogen adhesion to intestinal cell

- Immunoglobulin
- mucins

Detoxify bacterial lipopolysaccharide

Alkaline phosphatase

Immunomodulation

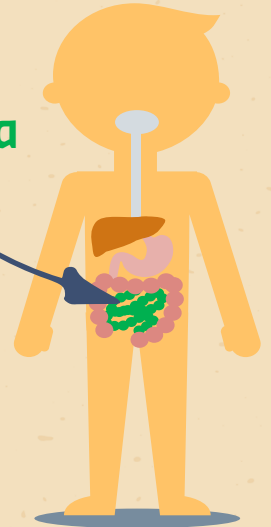
- Cytokines
- Osteopontin

1

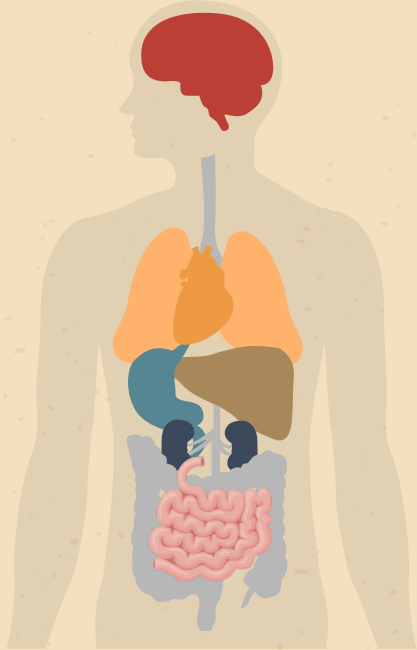
Objective

Identify intact whey protein & compare the whey protein survival extent across Adult GI tract between **WPI feed** vs. **Intestinal digesta**

- Use Bottom-Up LC-MS/MS-based proteomics
- Quantify PEG-28
- SDS-PAGE (Protein)



Bioactivities of Whey Bioactive Peptides



Antimicrobial

Antihypertensive

Antioxidant

Immunomodulatory

Opioid

Objectives

2

Identify whey-derived bioactive peptides released after GI digestion in the **intestinal digesta**

- Use top-down LC-MS/MS-based peptidomics
- SDS-PAGE (peptides)

Potential Research Significance



For dairy Industries

- Establish new product health claims
- Create novel products for specific target customer segments for targeted health benefits



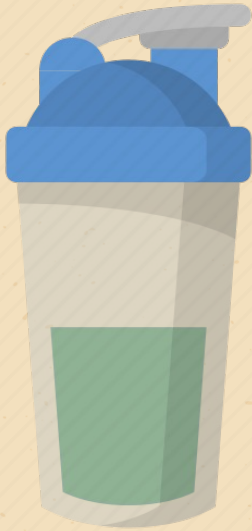
For future studies

Further research on the functional impacts of the intact whey proteins & bioactive peptides

03

Materials & Methods

Whey Protein Isolate (WPI) Feed



WPI shake contains:

- 40 g whey protein isolate (Provon 290, Glanbia, USA)
- 0.5 mg PEG-28 (Sigma-Aldrich, USA)
- 500 mL water
- Total calories 153 kcal

Subjects



Screening criteria

- No lactose & dairy protein intolerance
- No GI diseases, surgery, injury
- No esophageal anomaly

Age

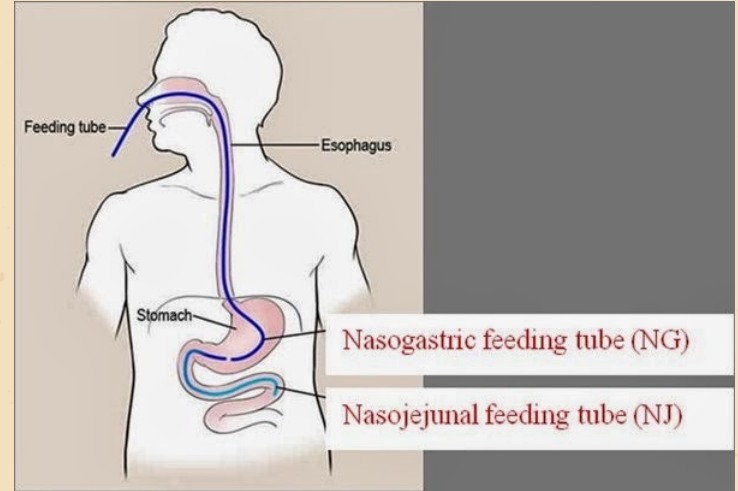
23±2 years

BMI

BMI 25±4 kg/m²

Gender

2 males, 1 female



Source: <https://www.nigindia.org/nasojejunal-tube-placement.php>

3 Days

Dairy-Free diet

1 Night before

Fasting overnight

Collection Day

- Nasojejunal tube inserted
- Consumed whey protein shake in 10 mins
- Collected jejunal fluid (0-4 hrs)

Preliminary SDS-PAGE Result

kDa

Intestinal fluids

250

150

100

75

Bovine Serum Albumin (68) -->

Heavy chain Immunoglobulin (55) -->

50

37

Caseins -->

25

Light chain immunoglobulin (22) -->

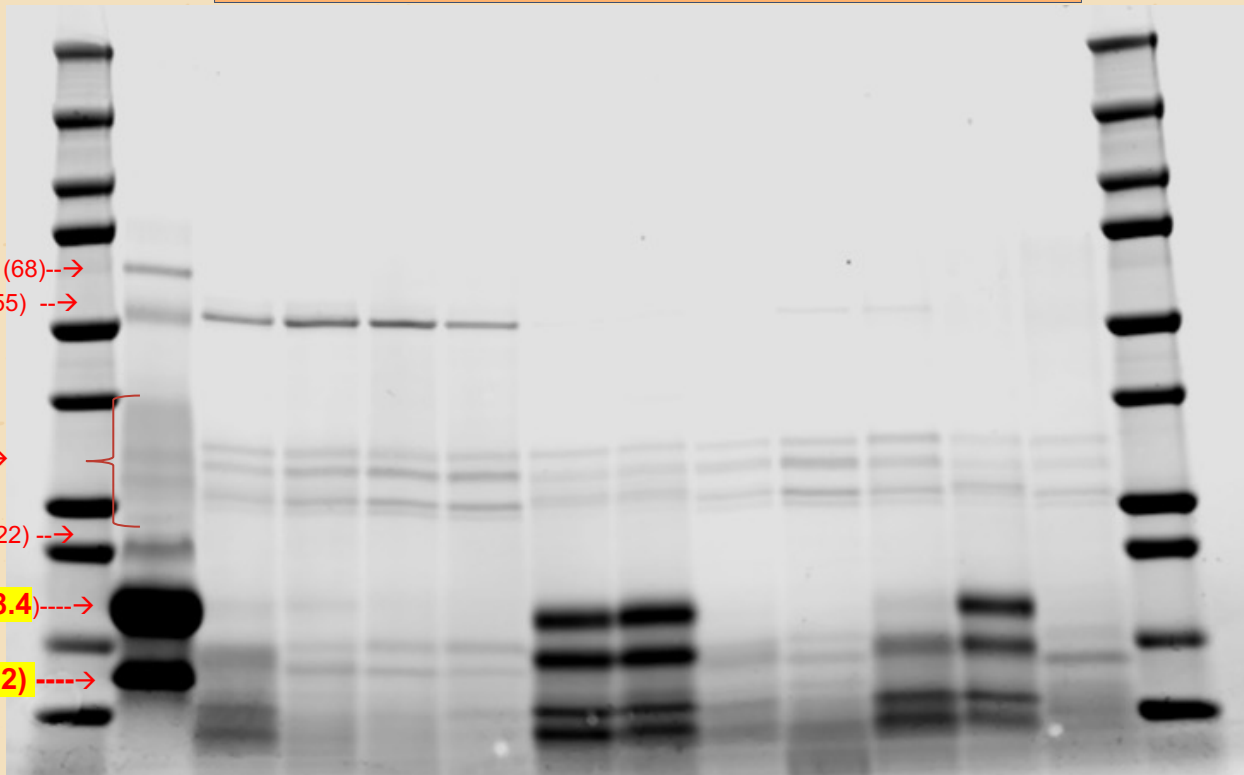
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β -Lactoglobulin (18.4) ----->

15

α -lactalbumin (14.2) ----->

10



WPI
Feed

A1H

A2H

A3H

A4H

B1H

B2H

B3H

B4H

C1H

C2H

C4H

THANKS!

Do you have any questions?

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