Production of Bioactive Peptides from the Para Rubber Seeds

Presented by

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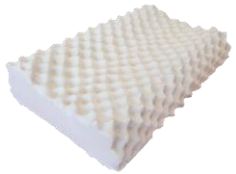
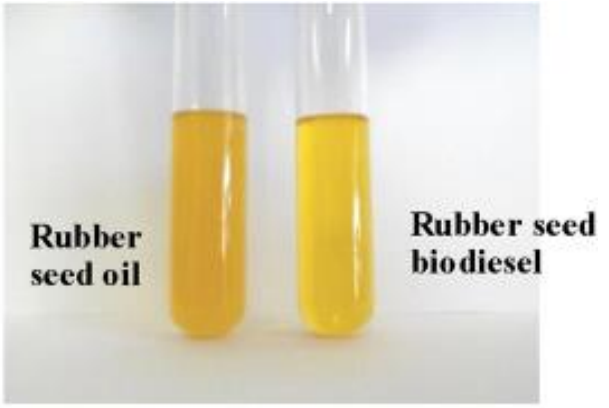
Outline

Background & Rationale





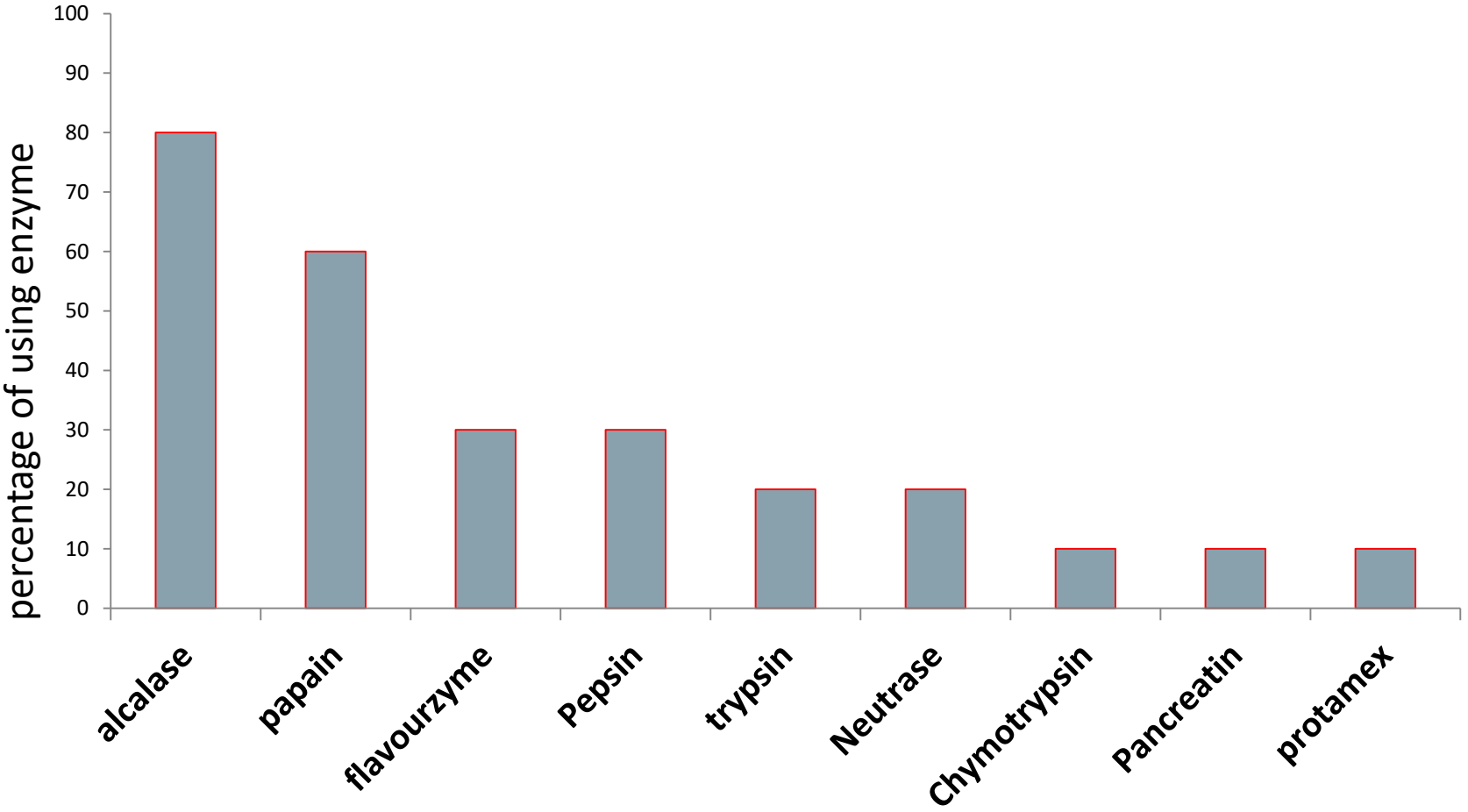
.....high protein.....

Protein Hydrolysate

Bioactive peptide

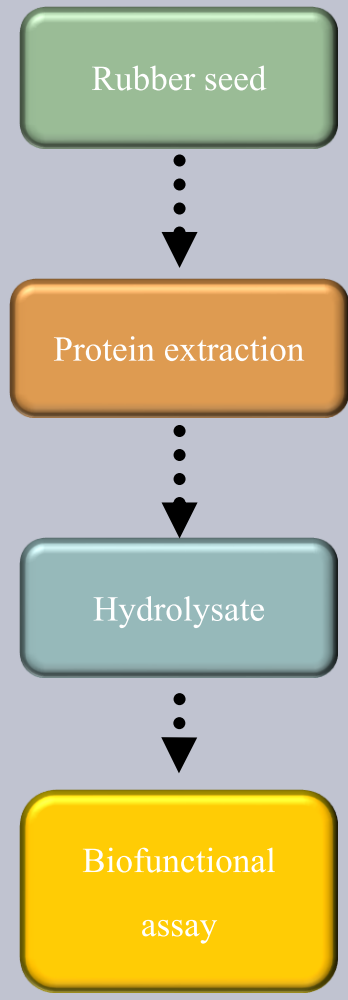
- Antioxidant
- Tyrosinase inhibitory
- Mineral binding
- ACE inhibitory
- Antithrombotic
- Immunomodulatory
- Antimicrobial
- Antihypertensive
- Opioid

Proteolytic enzymes for production of protein hydrolysate (2010-2019)



Objectives

- To optimize for protein extraction from Para rubber seed
- To prepare hydrolysate from the extracted protein
- To evaluate for the biological activity of the prepared protein hydrolysate



Expected Benefits

- Be able to obtain the preferable method for protein extraction from Para rubber seed
- Be able to prepare hydrolysate from the extracted protein
- Be able to determine the biological activity of the prepared protein hydrolysate

Methodology

Sample Preparation

Seed shell

Seed kernel

Hexane

Oil/Lipid

seed powder

Protein extraction from seed powder

50mM NaOH

\+ or 50mM Carbonate buffer, pH10

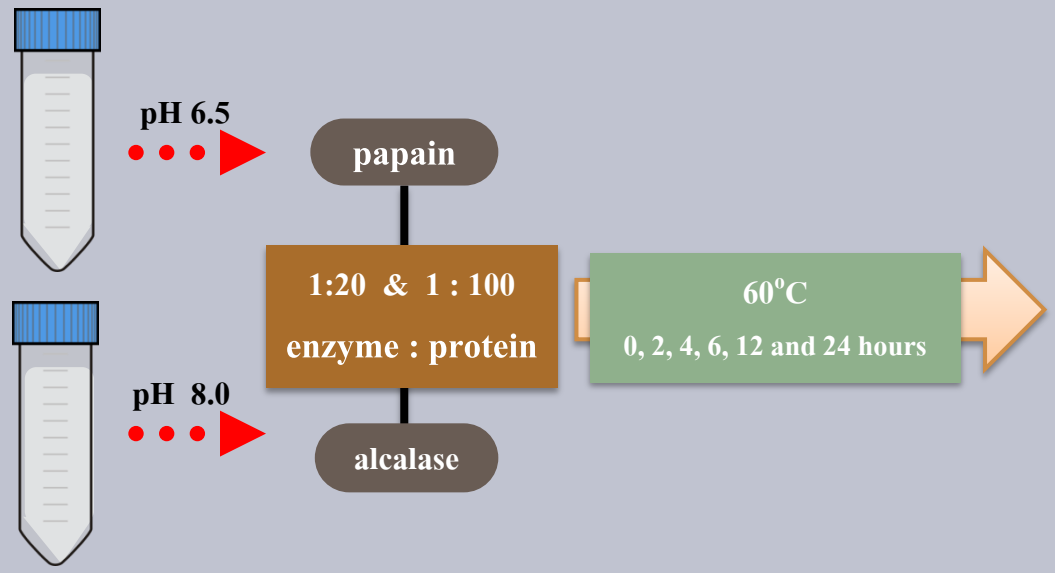
or Water

Microwave

(0 30 60 90 sec)

Hydrolysate production

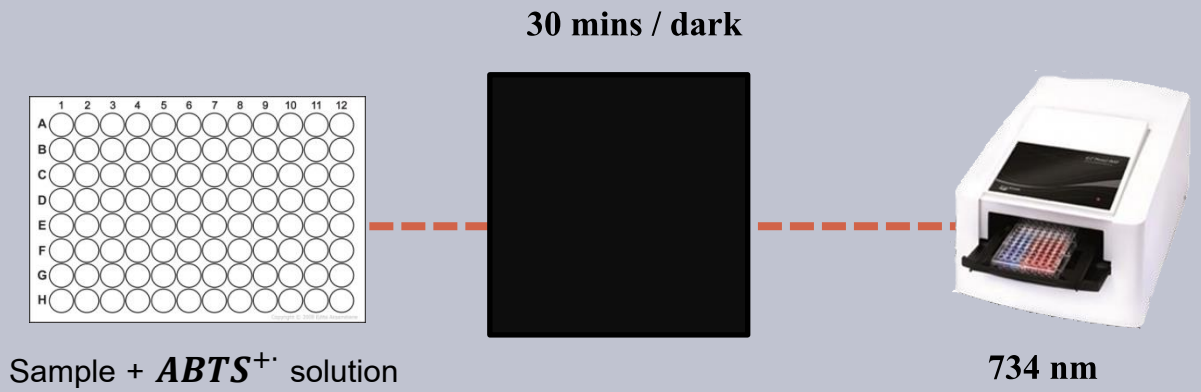
(Yu Fu, 2019)



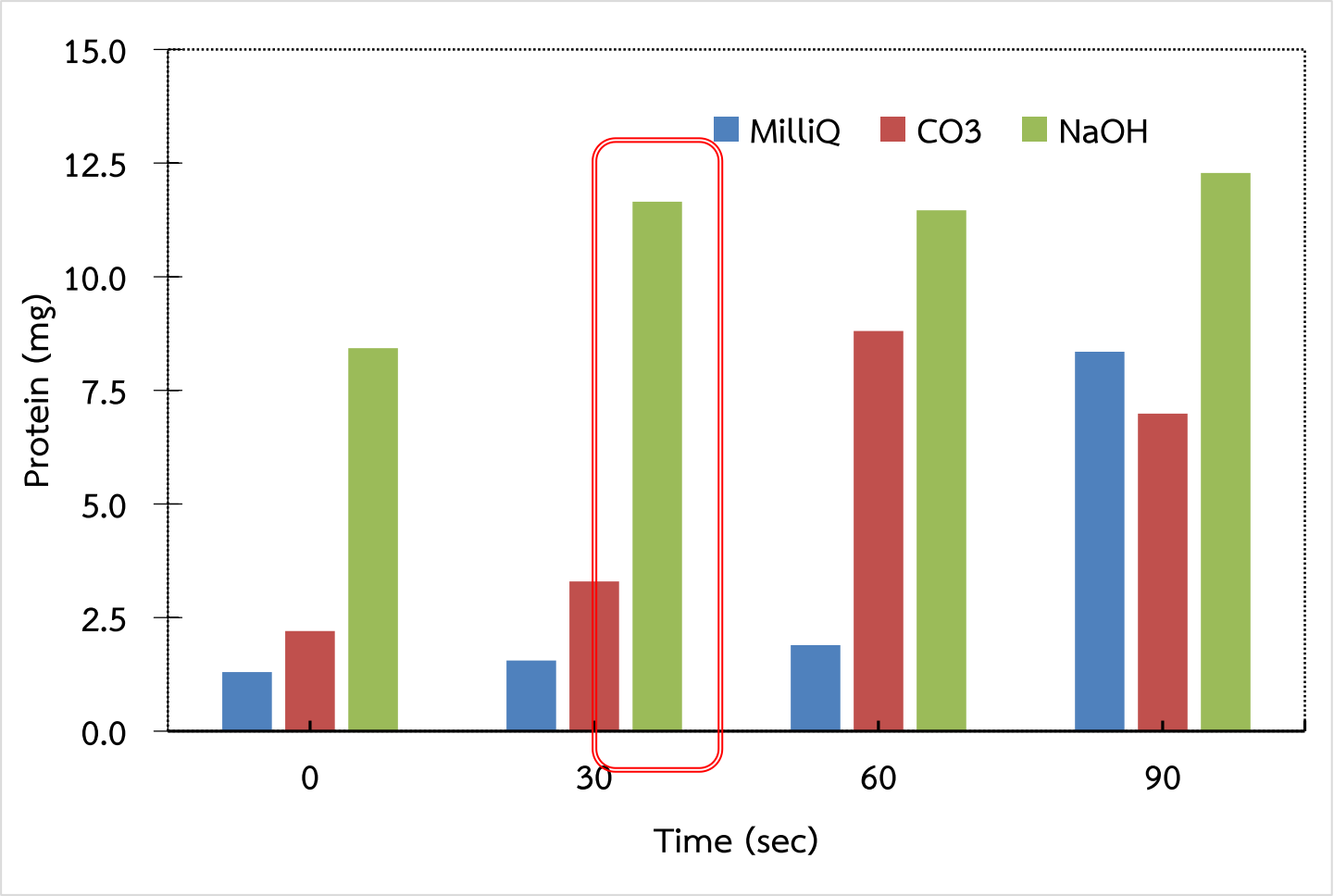
Antioxidant Assay

ABTS Radical Scavenging Assay

(บัณฑรวรรณ ธุระพระ และคณะ, 2559)



Results & Discussion



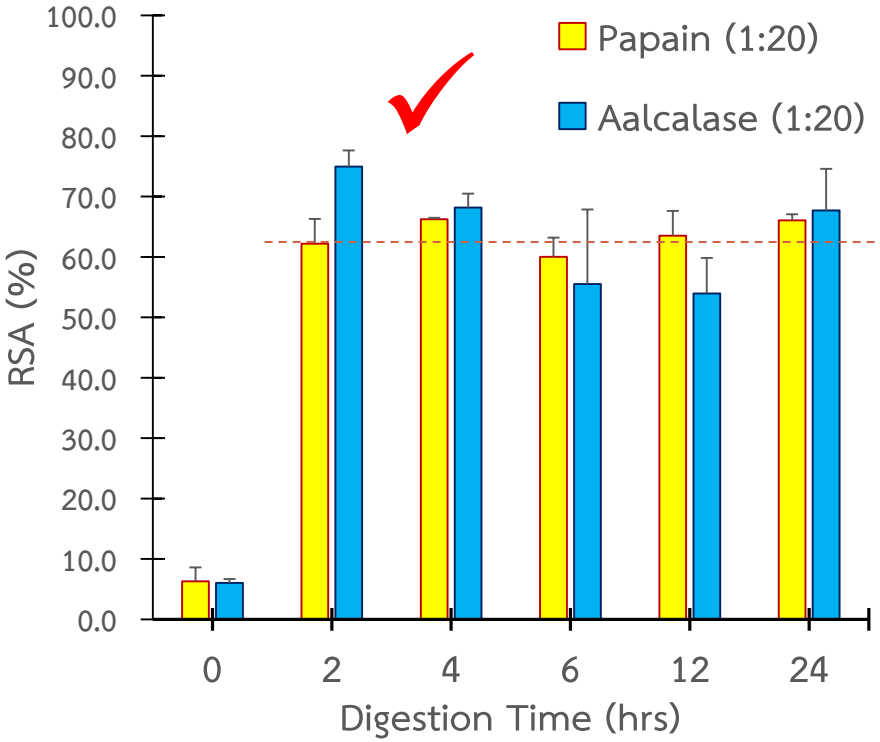
50 mM NaOH + microwave 800 Watts is good for protein extraction

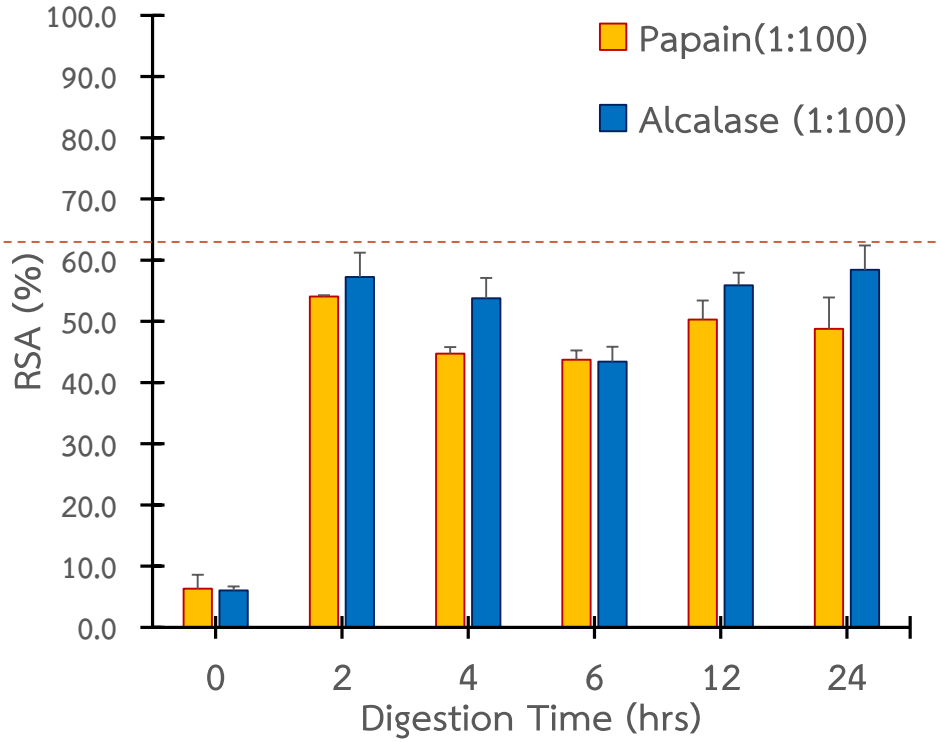
Time saver, Power saver

Results & Discussion

Effect of Enzyme: Protein Ratio on Radical Scavenging Activity by ABTS Assay

Digested of just 2 hrs is enough => short time best RSA
1:20 > 1:100 ; Alcalase > Papain

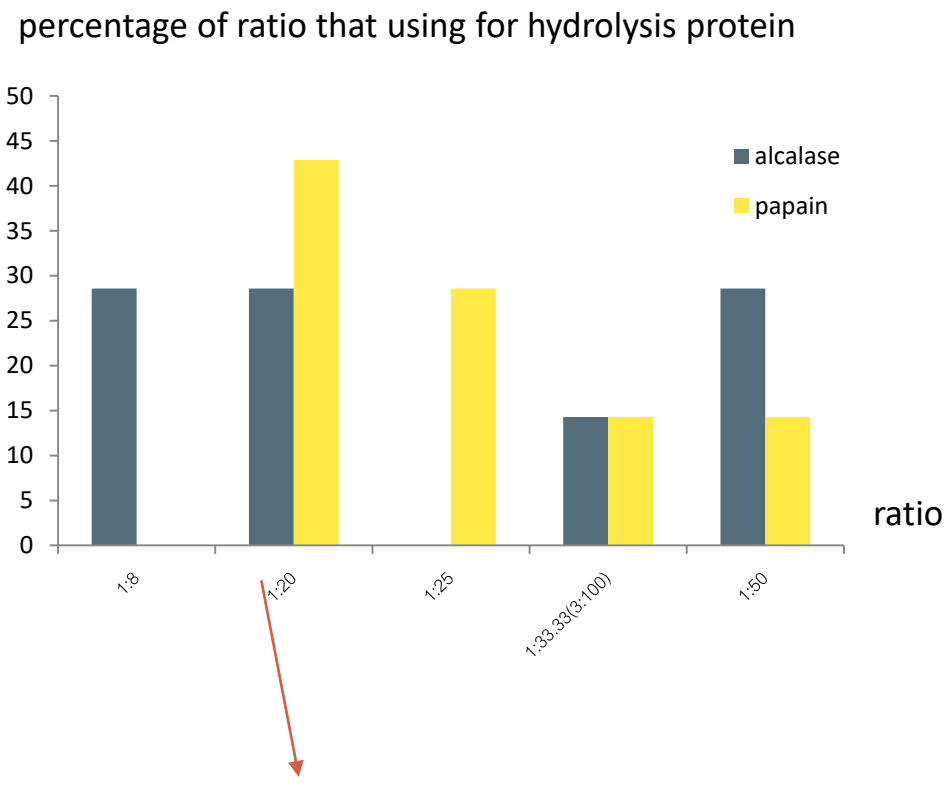




Frequency of digestion time for production of protein hydrolysate (2010-2019)

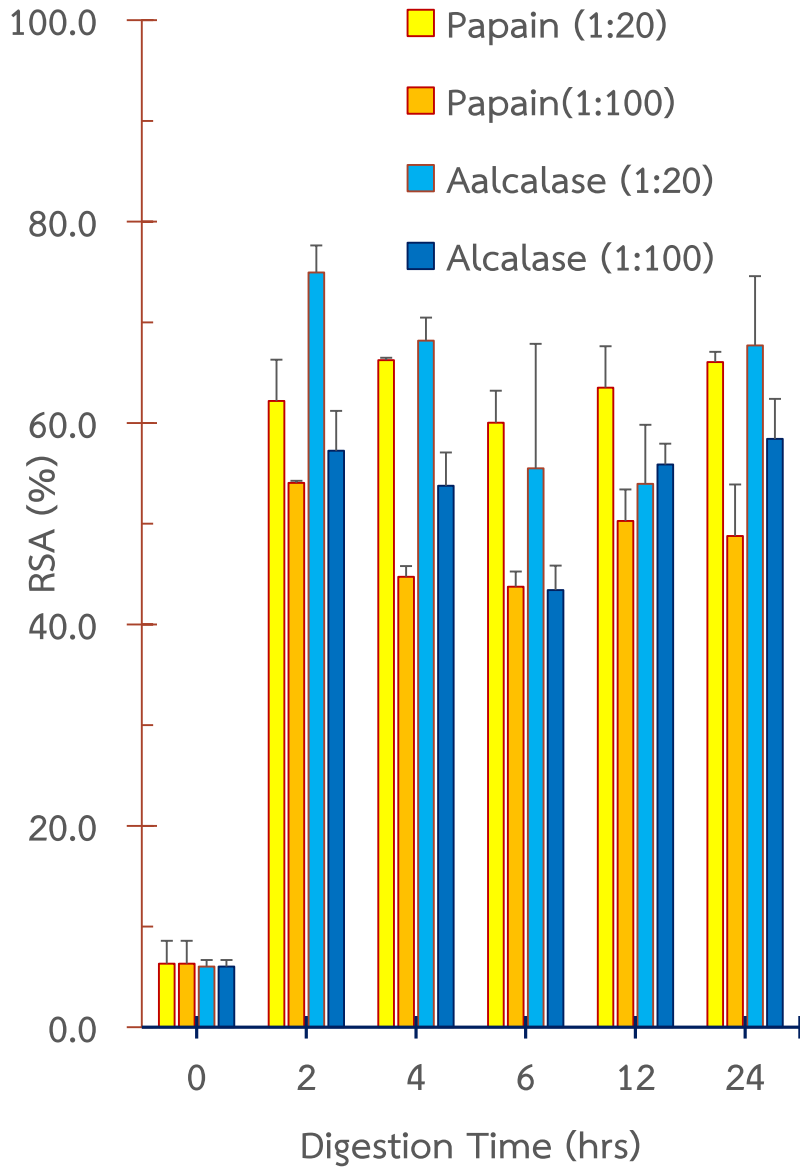
2 Hrs

Frequency of Enzyme : Protein ratio for production of protein hydrolysate (2010-2019)



1:20

Summary



What would be the best conditions?

1. Enzymatic digestion improved RSA of para seed protein.

2. Longer time doesn't mean for the best RSA.

   2-hour is enough ($p<0.05$)

   by Analysis of Variance (ANOVA) and Duncans' Multiple Range Test (DMRT).

3. 1:20 or 1:100 doesn't matter by 2 hrs of digestion

   T-test said 1:20 gave the best RSA ($p<0.05$)
   But 1:100 may help to save the cost of enzyme.

4. Alcalase or Papain?

   T-test suggested Alcalase ($p<0.05$).
   But papain is relatively cheaper and available in powder that may easy to handle rather than liquid form of ALcalase.

Statistic Supports Science

Alcalase at 1:20 (enzyme:protein) for 2-hour at 60 °C.

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THANK YOU
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ARE THERE
ANY QUESTIONS ?