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Hydrolyzed legume flours: An alternative for improving protein and starch digestion in infant puree

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INTRODUCTION & AIM

Protein hydrolysates are essential in infant food formulations due to their high nutritional value and ease of digestion compared to native proteins. This study evaluates the impact of different enzymatic hydrolysis conditions on legume flours on *in vitro* protein and starch digestion to determine their suitability for infant foods.

METHOD

Samples

Chickpea **(CP)**

Lentil **(L)**

Pea **(P)**

Ground

Hydrolysis methods

A) Alcalase(**H**)

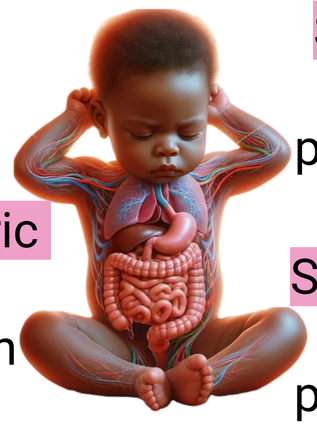
B) Alcalase (**HT**)

C) Pepsin (**P**)

Previously heat treatment and mild acid before

Control samples (**C**) = legumes without hydrolysis

***In vitro* digestion under infant conditions**



Simulated gastric phase:
pH= 5.3; pepsin 485 U/ml

Simulated oral phase:
pH= 7; α-amilase 75 U/ml

Simulated intestinal phase:
pH= 6.6; pancreatin + bile salts

Figure 1: Principal factors and phases on *In vitro* digestion simulated conditions for infants aged 6-12 months[1]

Analyses

- Degree of protein hydrolysis (DH) by the o-phthaldehyde method (OPA)
- Starch hydrolysis by the dinitrosalicylic acid method (DNS)

RESULTS & DISCUSSION

Table 1: Digested *in vitro* starch of control and hydrolyzed samples under infant conditions.

Samples	Digested *in vitro* starch(%)
Cp-C	45.5 ± 4.2
Cp-H	63.1± 0.0
Cp-HT	65.0 ± 0.4
Cp-P	31.1 ± 0.5
L-C	31.6 ± 4.3
L-H	41.0 ± 2.2
L-HT	63.1 ± 9.6
L-P	55.5 ± 3.3
A-C	29.0 ± 4.6
A-H	44.1 ± 7.8
A-HT	65.7 ± 0.0
A-P	36.3 ± 0.8

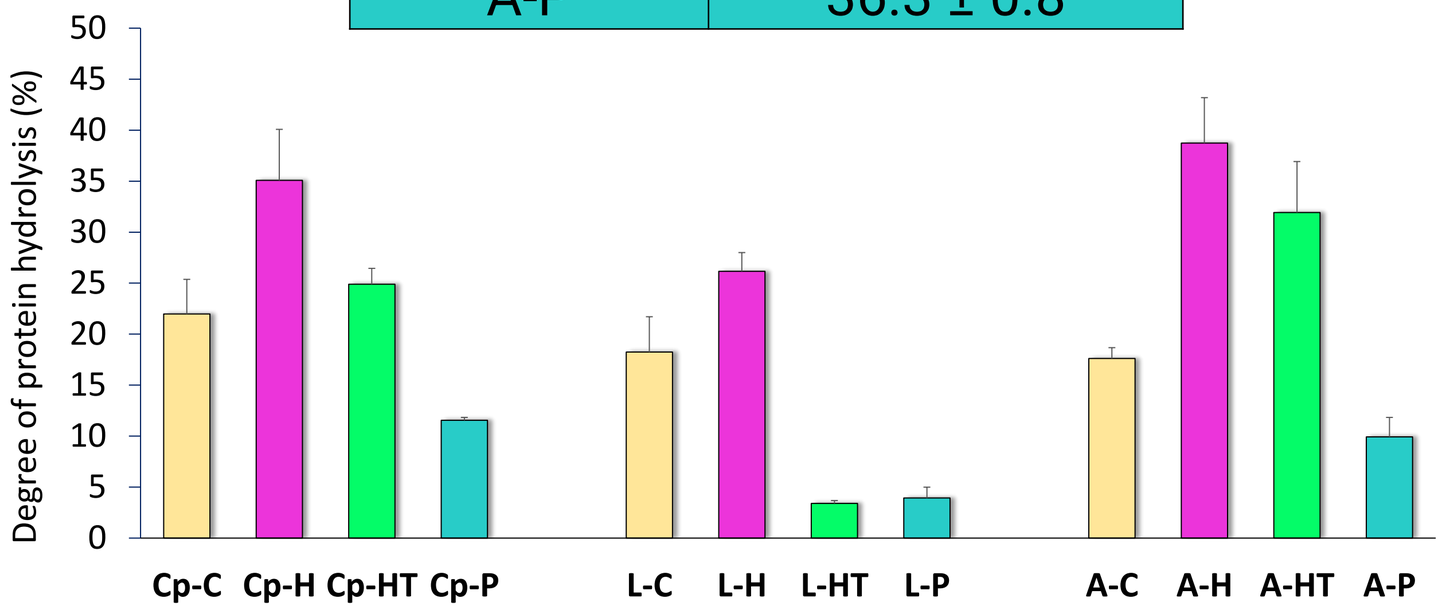


Figure 2: Digested *in vitro* proteins of control and hydrolyzed samples under infant conditions.

CONCLUSION

Enzymatic hydrolysis with alcalase (method **A**) is the most effective method for enhancing legume protein and starch digestibility in infant food formulations. Hydrolyzed legume flours can be used to develop more nutritious. palatable infant foods and. and can be used to innovatively apply enzymatic hydrolysis to legumes.

FUTURE WORK / REFERENCES

[1] Rodriguez. M. D.. León. A. E.. & Bustos. M. C. (2024). Co-ingestion of cereals and legumes during infant complementary feeding: starch and protein *in vitro* digestion. Plant Foods for Human Nutrition. 1-8.