ACID GELATION OF FABA BEAN PROTEIN INGREDIENTS

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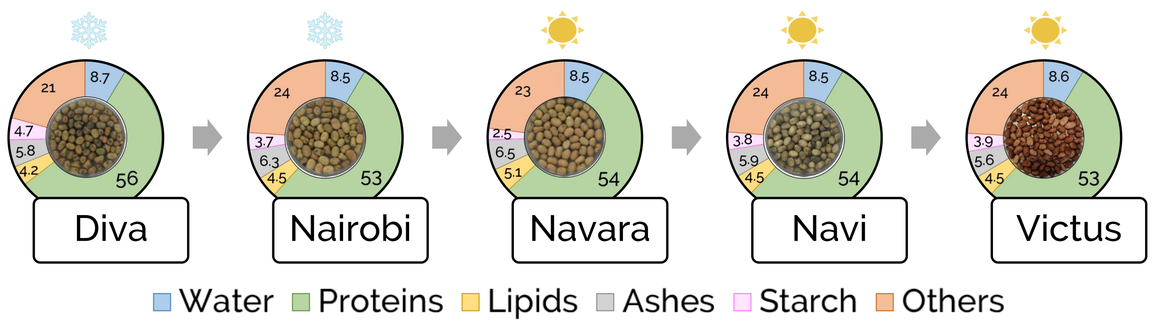
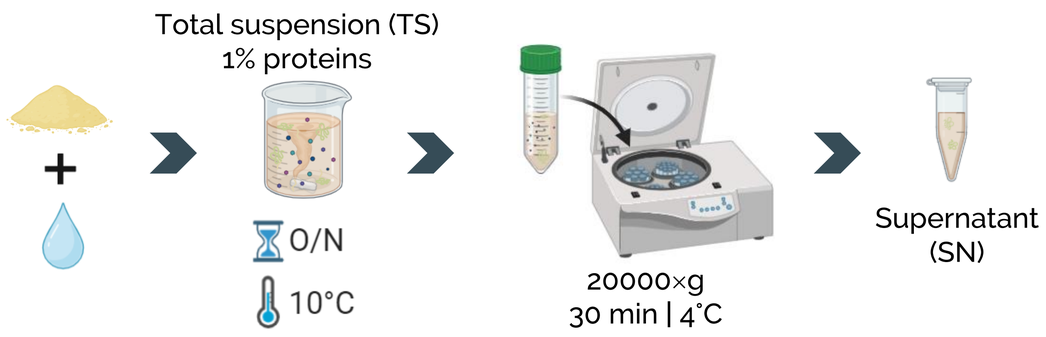
INTRODUCTION

Increased interest in healthier foods is closely linked to growing environmental awareness and, as a result, the use of plant proteins is emphasized. In this context, pulses, which are rich in proteins, are very promising candidates and, particularly, there is a rising interest for faba bean (*Vicia faba* L.) as ingredient to produce processed food. The aim of this study was to find the **optimal conditions** for the production of dairy like acid gels using faba bean protein ingredients obtained by **dry fractionation** from five different cultivars. These cultivars were selected based on their variabilities in protein content.

EXPERIMENTAL APPROACH

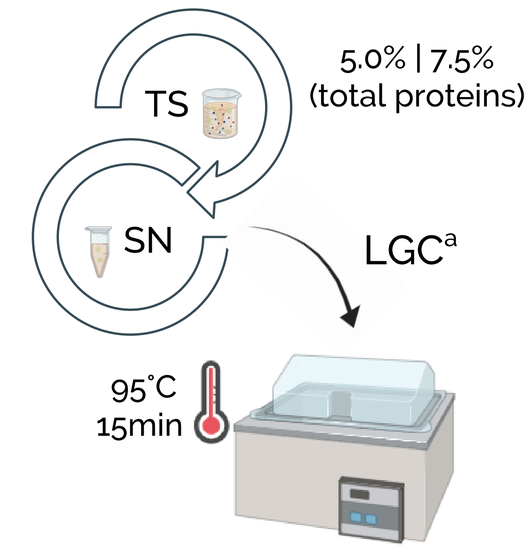


1 SAMPLE PREPARATION

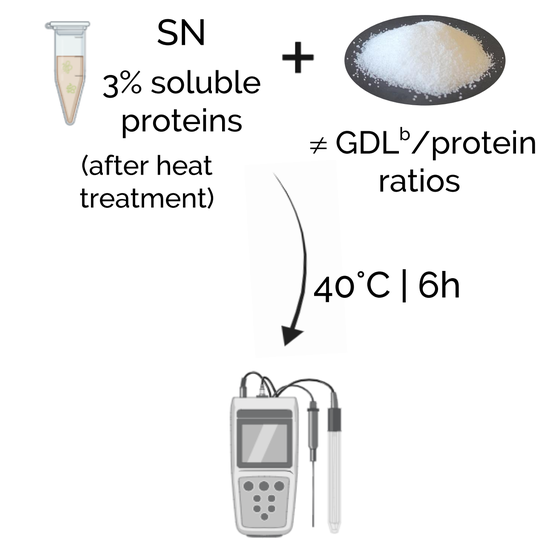


2 GELLING PROPERTIES

A Thermal gelation

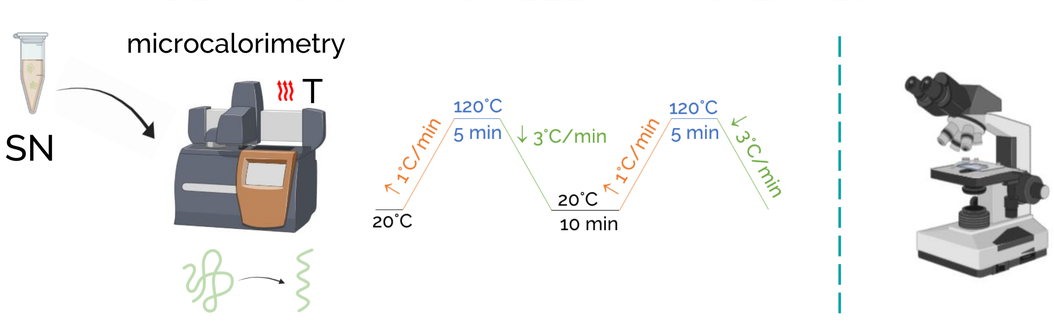


B Acid gelation



3 SAMPLE CHARACTERIZATION

DENATURATION & GELLING PROPERTIES



CONCLUSIONS

- Influence of faba bean cultivar:
  - ✓ Temperature denaturation and LGC;
  - ✓ Particle size after heat treatment of supernatant;
  - ✓ Final pH after acidification.
- High potential of these ingredients in the production of acidified processed foods such as yoghurt and cream cheese.

NEXT STEPS

1. Rheology study of acid gels produced from supernatants.
2. Screening conditions for the production of dairy like acid gels (yogurt and cream cheese type emulsions).
3. Characterization and rheology study of acidified emulsions.

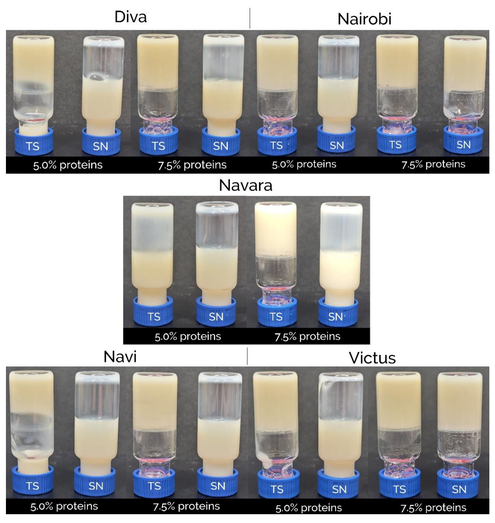
RESULTS & DISCUSSION

μDSC: denaturation T

Sample	T_{onset} (°C)	T_{offset} (°C)	$T_{peak\ maximum}$ (°C)
Diva	75.2 ± 0.0	88.5 ± 0.1	82.4 ± 0.0
Nairobi	*70.0 ± 1.1*	*91.0 ± 0.5*	82.8 ± 0.1
Navara	72.0 ± 0.8	90.5 ± 1.9	82.8 ± 1.4
Navi	73.1 ± 2.3	90.7 ± 2.7	82.9 ± 0.9
Victus	74.0 ± 2.0	90.4 ± 2.1	82.8 ± 0.6

At least T = 91°C for total protein denaturation.

A Thermal gelation



LGC

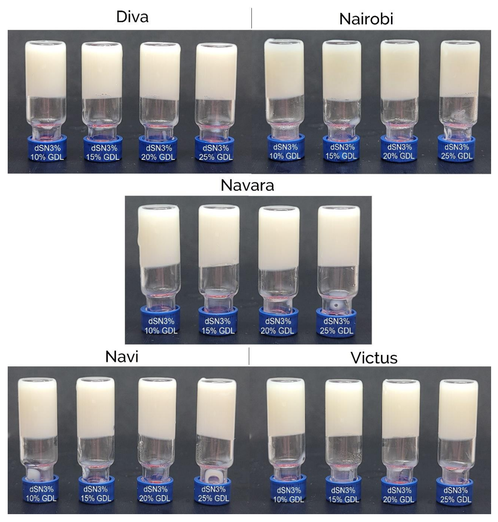
i. Total suspension:
   - 5% → Nairobi | Victus
   - 7.5% → Diva | Navara | Navi

ii. Supernatant:
   - 7.5% total suspension → Nairobi | Victus

Protein content in the supernatant?

SN at 3% soluble proteins

B Acid gelation

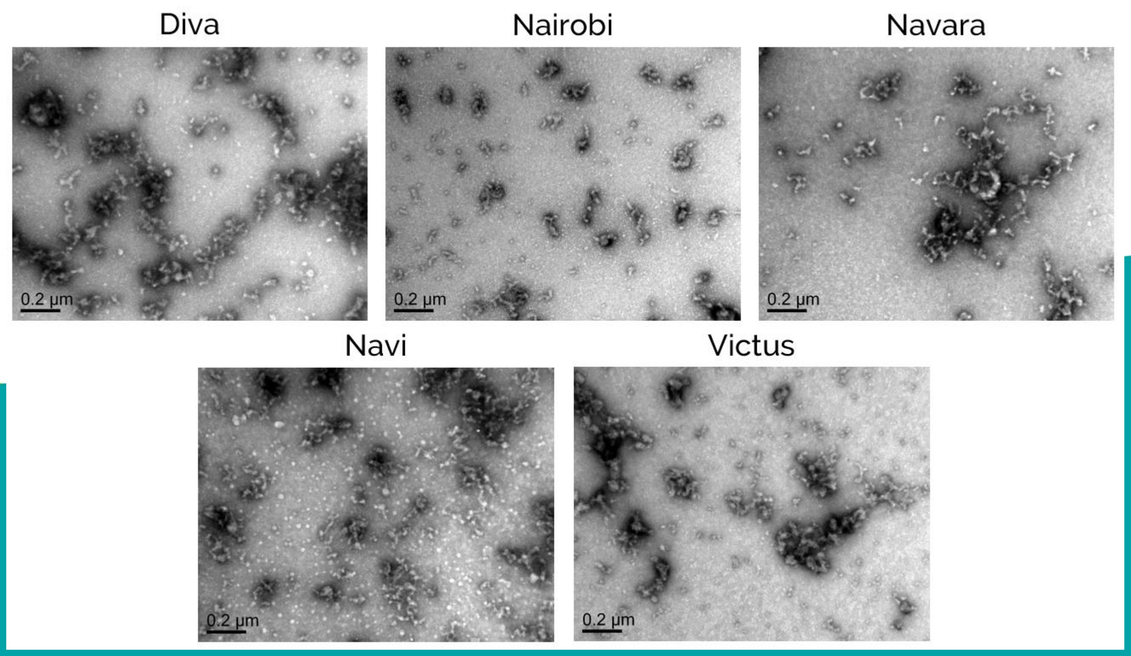


Sample	GDL/protein ratio	pH_{6h}
Diva	15%	4.70
	20%	4.40
Nairobi	15%	4.80
	20%	4.54
Navara	20%	4.66
	25%	4.46
Navi	20%	4.68
	25%	4.48
Victus	20%	4.68
	25%	4.50

→ Influence of the buffering power.

GDL/protein ratio = 20%

CHARACTERIZATION



- Different particle sizes and distributions.
- Different shapes of particles/ aggregates after heat treatment.

[a]LGC: least gelling concentration. [b]GDL: glucono-delta-lactone.