

FINE-TUNING EXTRUSION PROCESSING PARAMETERS TO ENHANCE THE TEXTURAL AND NUTRITIONAL QUALITY OF SOY-BASED MEAT ANALOGS

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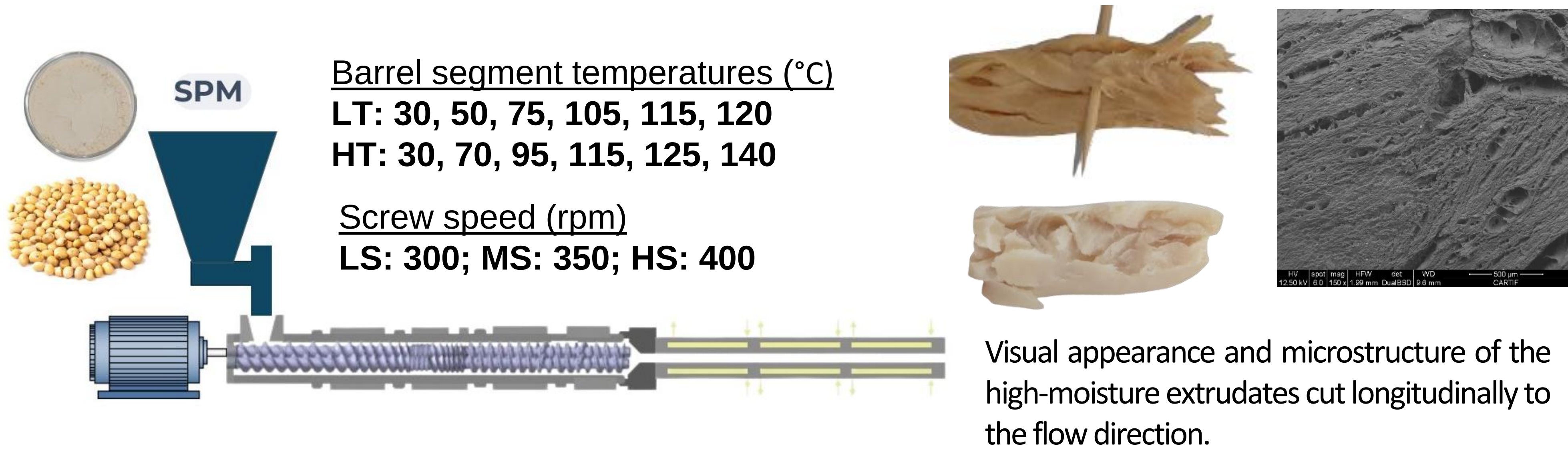
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INTRODUCTION

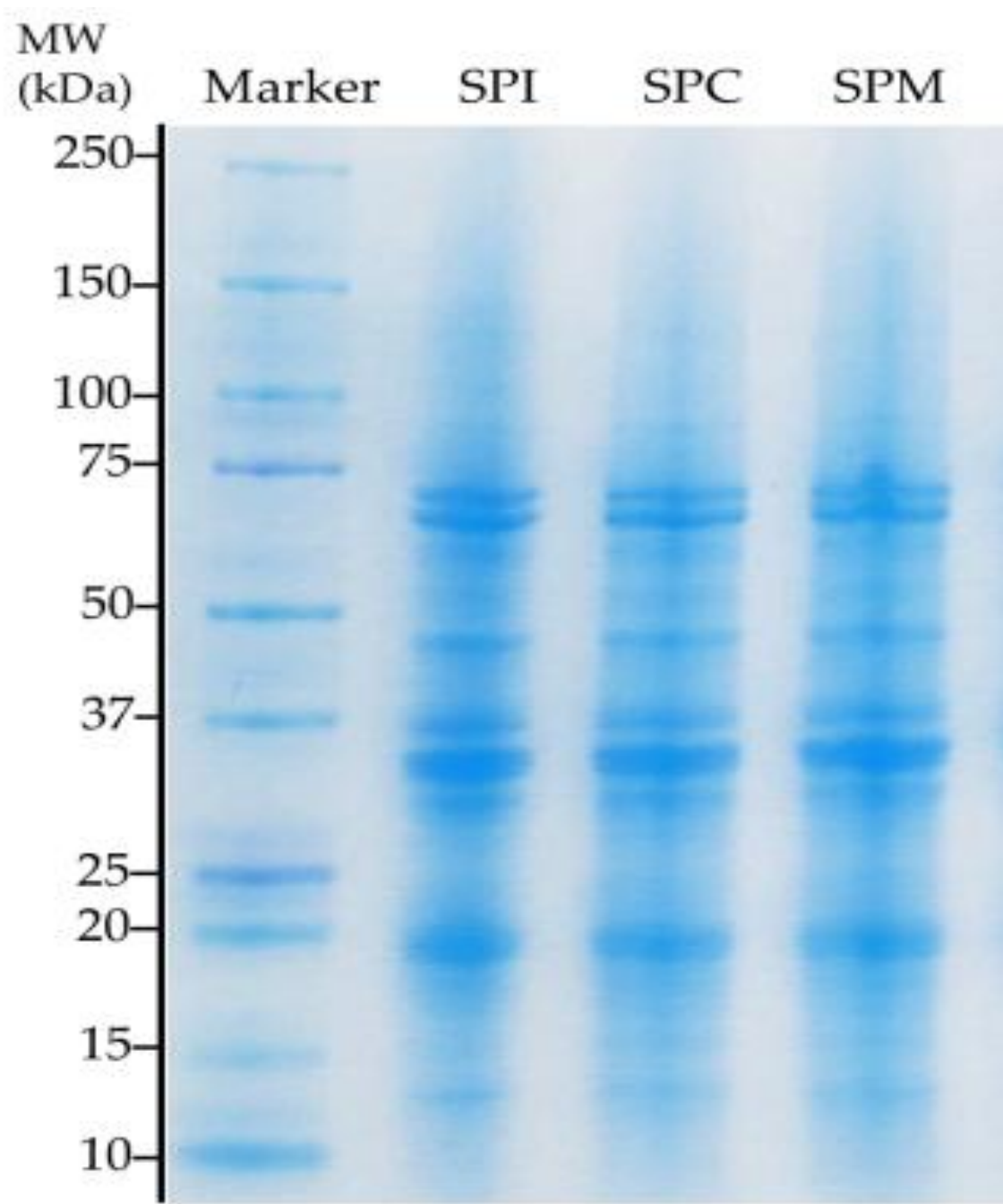
This study aimed to evaluate the influence of extrusion temperature and screw speed on the textural, structural and nutritional properties of soy-based meat analogs produced from a blend of soy protein concentrate (SPC) and soy protein isolate (SPI), (9:1), (SPM).

EXPERIMENTAL DESIGN

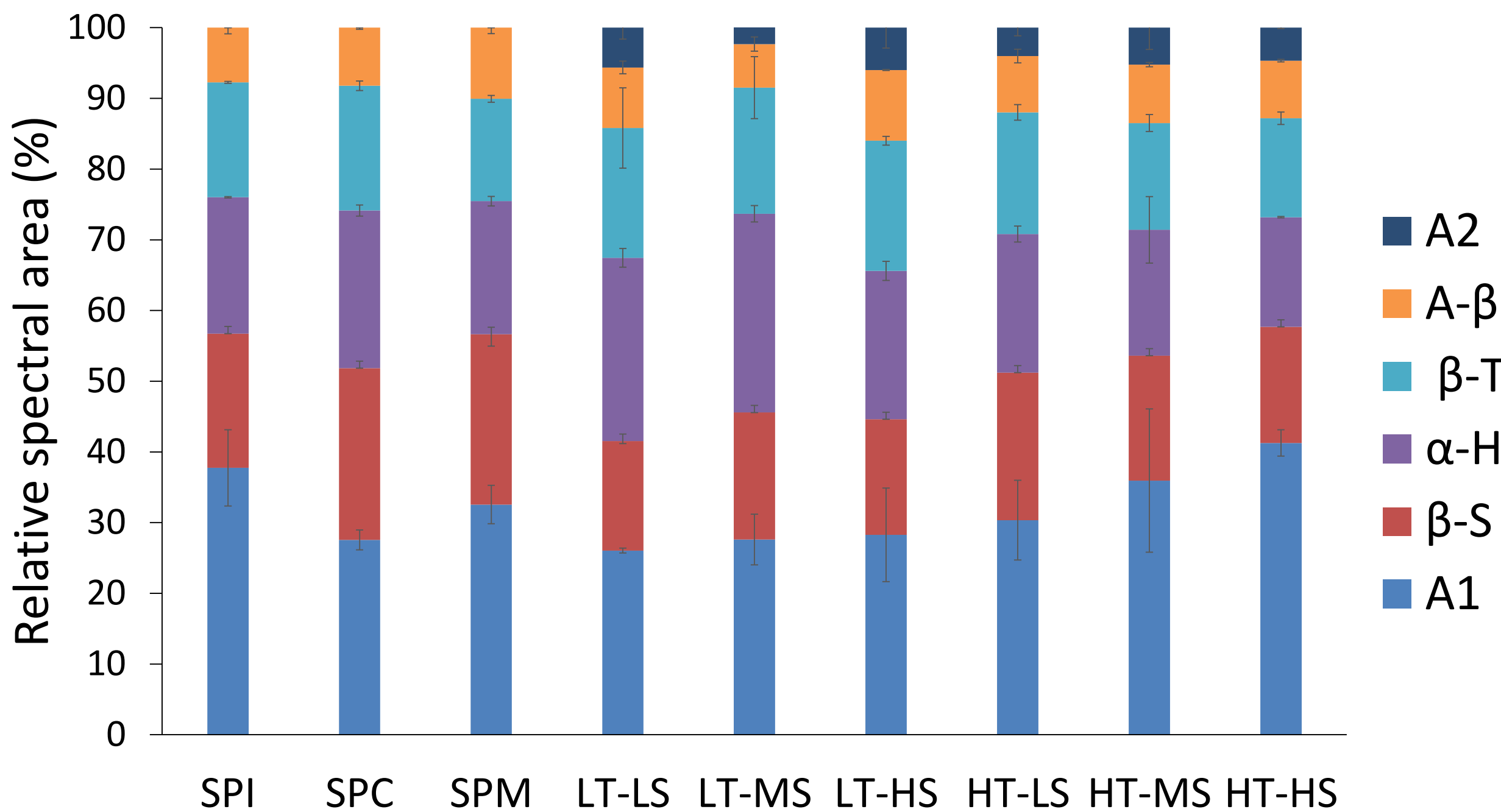


RESULTS

Protein molecular profile (SDS-PAGE)



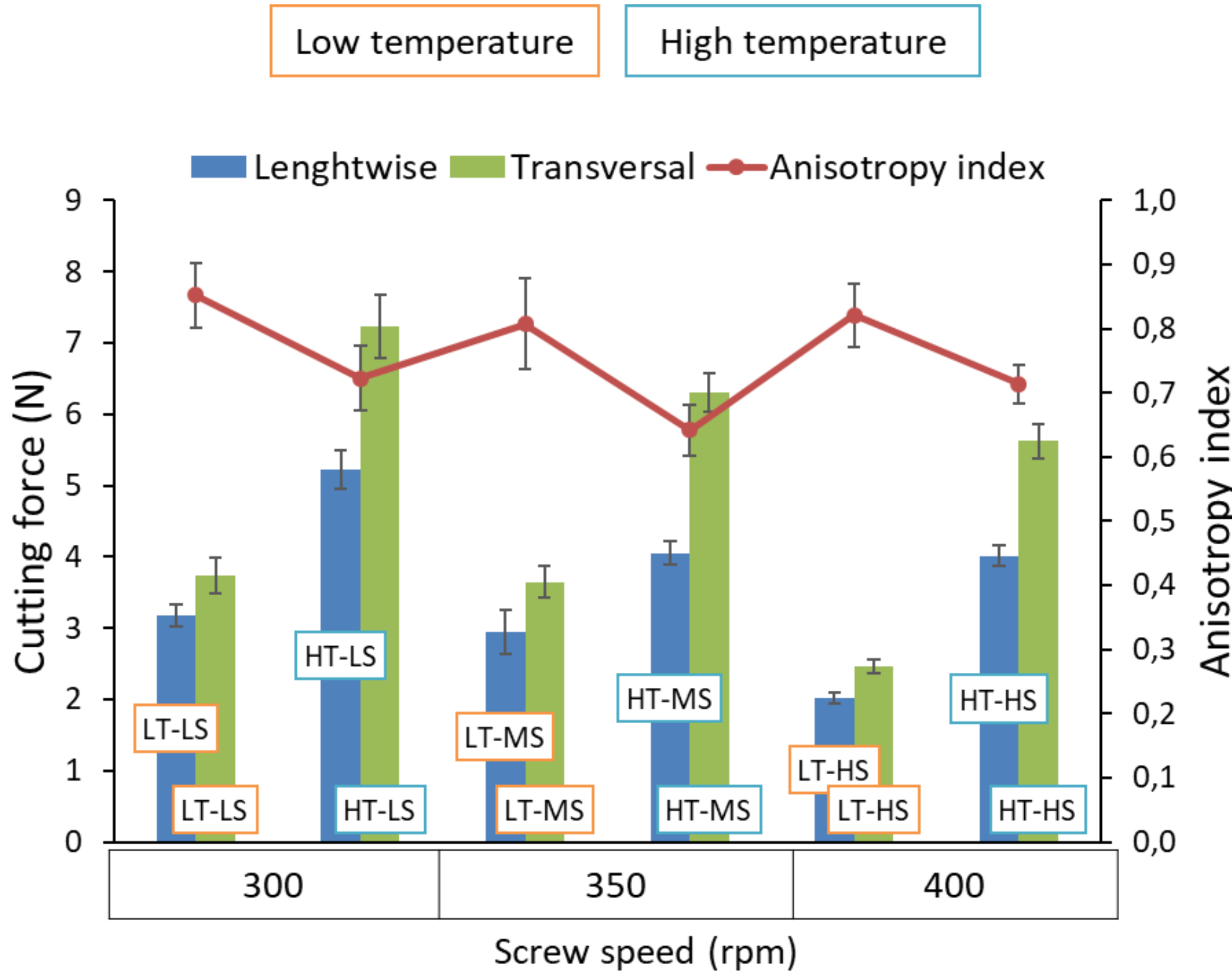
Changes in protein secondary structure during extrusion



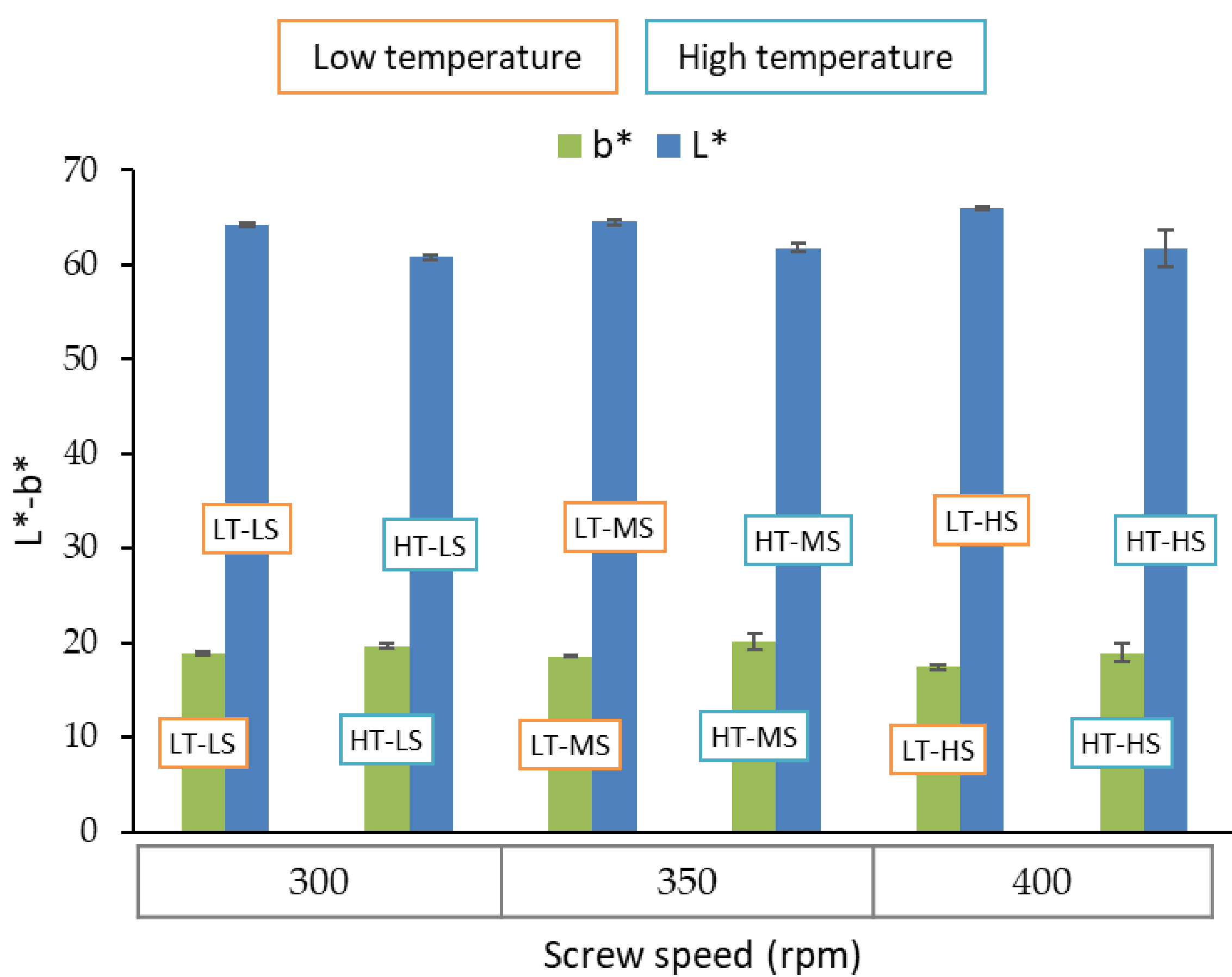
Trypsin inhibitors

Samples	mg inhibitors/g
SPI	4.62±0.76
SPC	7.4±1.01
SPM	2.51± 0.82
LT-LS	<0.1
LT-MS	0.1±0.0
LT-HS	0.16±0.93
HT-LS	<0.1
HT-MS	0.2±0.76
HT-HS	<0.1

Textural properties



Color CIE L*-b*



CONCLUSIONS

FTIR analysis denoted a reduction in β -sheet structures and an increase in aggregated protein structures upon extrusion, particularly at higher temperature (140°C). Trypsin inhibitors decreased by over 90%, improving the nutritional quality under all extrusion conditions. Higher extrusion temperatures led to softer, darker extrudates with enhanced visual anisotropy, whereas increased screw speeds resulted in lighter, softer textures but with minimal impact on fiber alignment. These findings highlight the importance of selecting the appropriate extrusion parameters to optimize both the textural and nutritional properties of plant-based meat analogs.

REFERENCE: Ribeiro, G., Piñero, M.-Y., Parle, F., Blanco, B., & Roman, L. (2024). <https://doi.org/10.3390/foods13111748>