

PRODUCTION OF TEXTURIZED VEGETABLE PROTEINS FROM FABA BEAN ISOLATE AND CONCENTRATE

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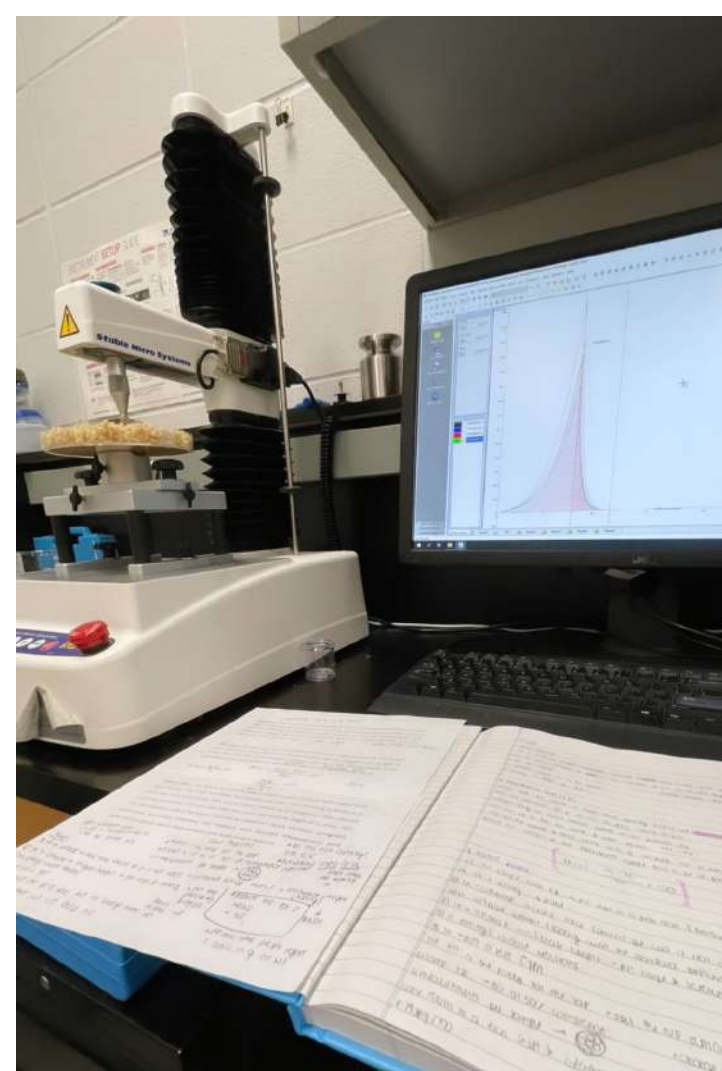
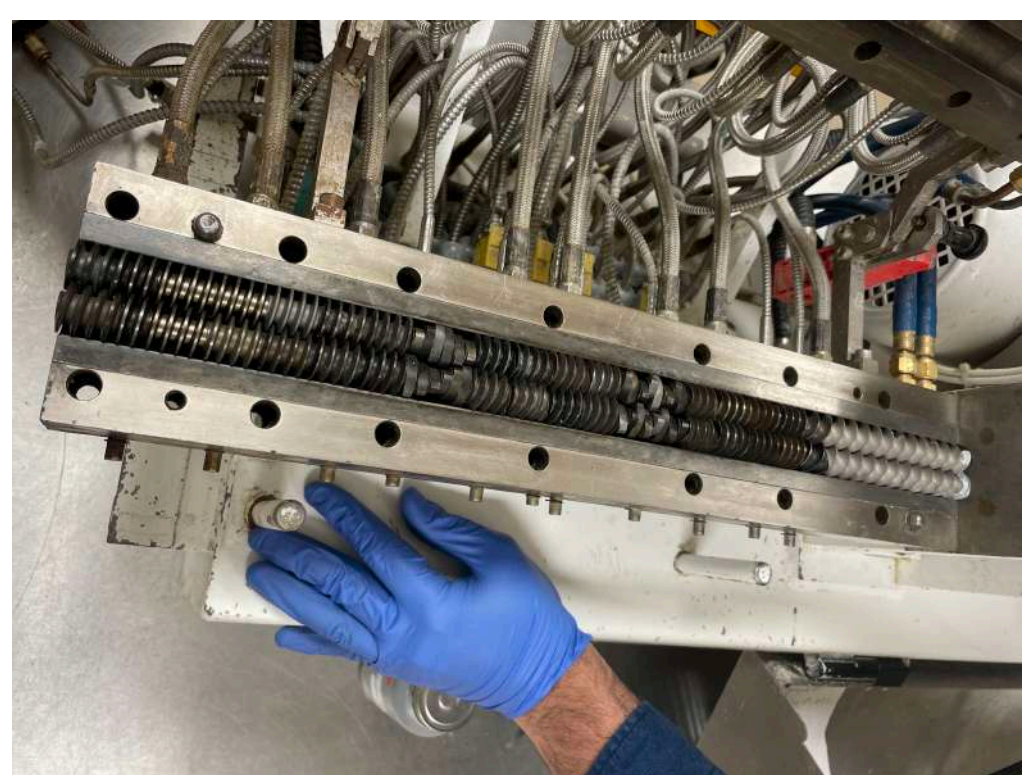
INTRODUCTION

- ✓ Legumes are a sustainable source of protein with 17-41% depending on the crop.
- ✓ Faba bean has around 29.76%
- ✓ Low moisture extrusion (<50%MC), uses shear, heat and pressure to create texturized vegetable proteins (TVPs) from pulses.
- ✓ The combination of temperature, screw speed and moisture content creates a porous structure that can mimic sensory and functional properties of meat when rehydrated.
- ✓ The aim of this study was to produce texturized vegetable proteins with faba isolate and concentrate throughout low moisture extrusion as an alternative protein source that can be used as a replacement for animal meat



MATERIAL AND METHODS

- ✓ Faba bean isolate (70%) and concentrate (30%) was extruded to make TVPs with a lab scale, co-rotating, twin-screw extruder.
- ✓ Functional and physical properties of TVPs were measured including:
 - ✓ Water holding capacity (WHC) & Oil holding capacity (OHC)
 - ✓ protein content
 - ✓ Color
 - ✓ Bulk density (BD)
 - ✓ Rehydration ratio (RR)
 - ✓ Texture profile.



Conditions for Faba TVPs

	Temperature [°C]	Moisture content [%]	RPM
Treatment 1 [T1]	125	35	200
Treatment 2 [T2]	125	35	300
Treatment 3 [T3]	125	35	400
Treatment 4 [T4]	125	30	300
Treatment 5 [T5]	125	40	300
Treatment 6 [T6]	140	35	300
Treatment 7 [T7]	110	35	300

Raw faba: 70% isolate+ 30% concentrate
 CTVP1: Commercial pea TVP 1
 CTVP2: Commercial pea TVP2

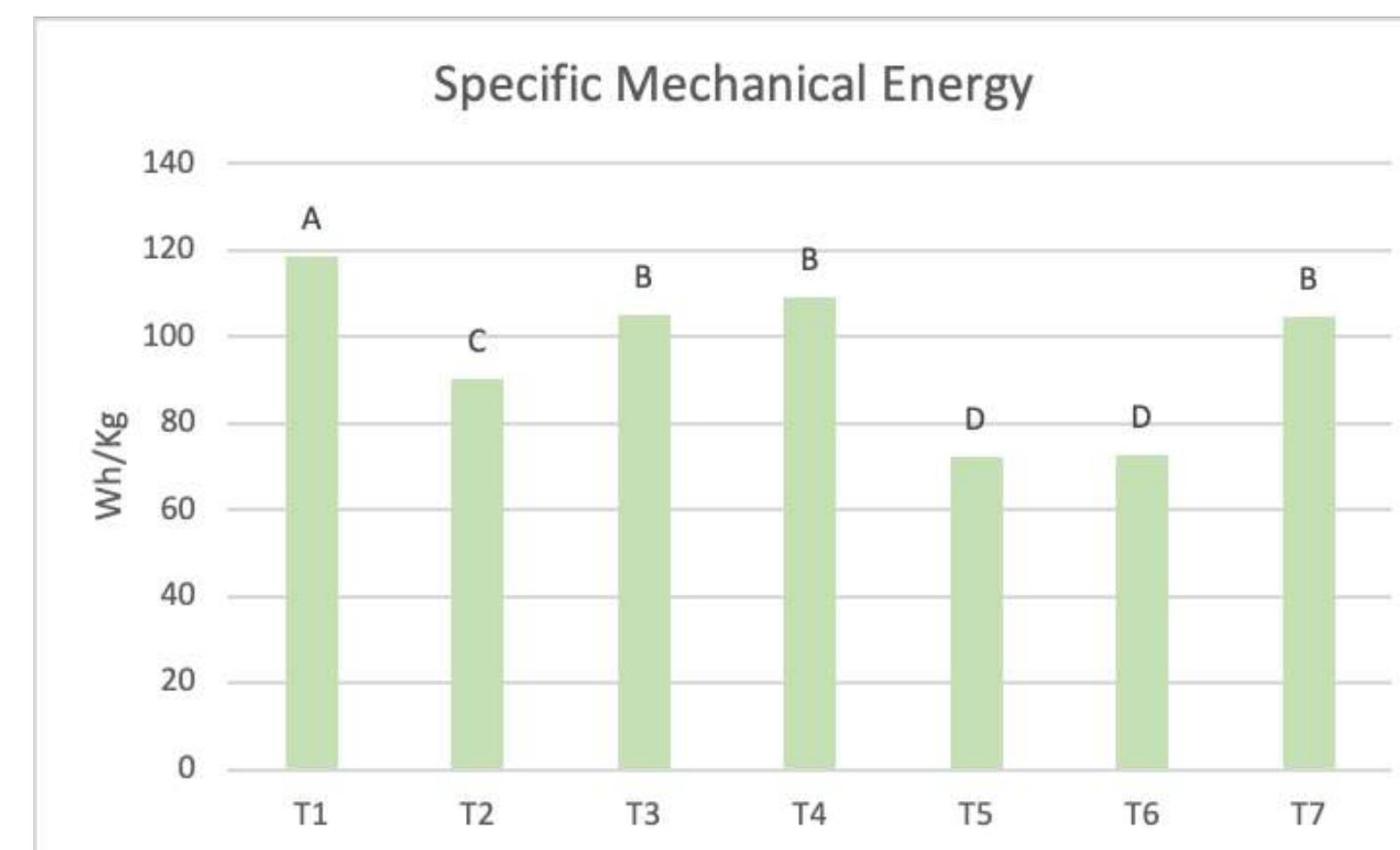
ACKNOWLEDGEMENTS

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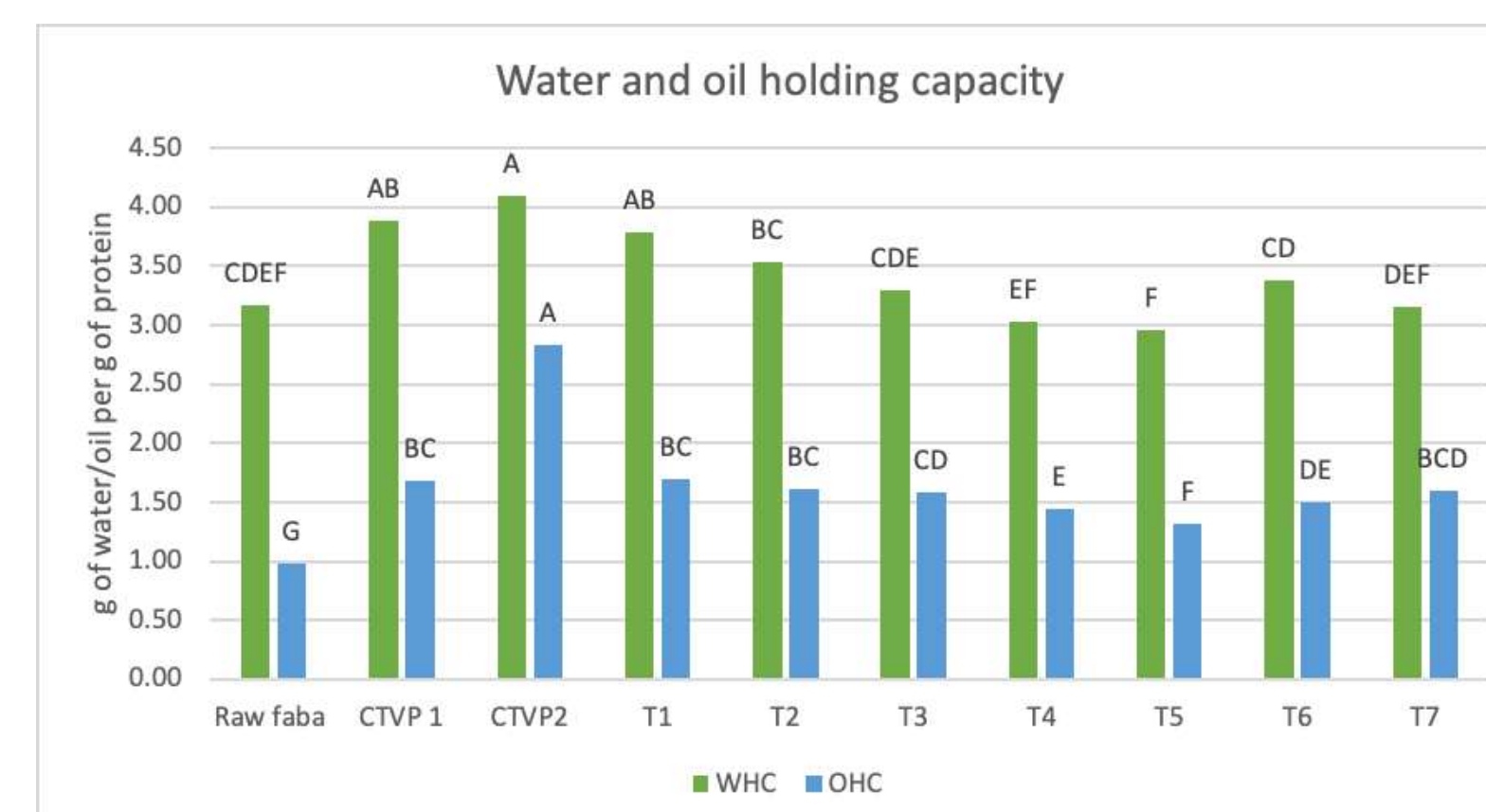
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RESULTS



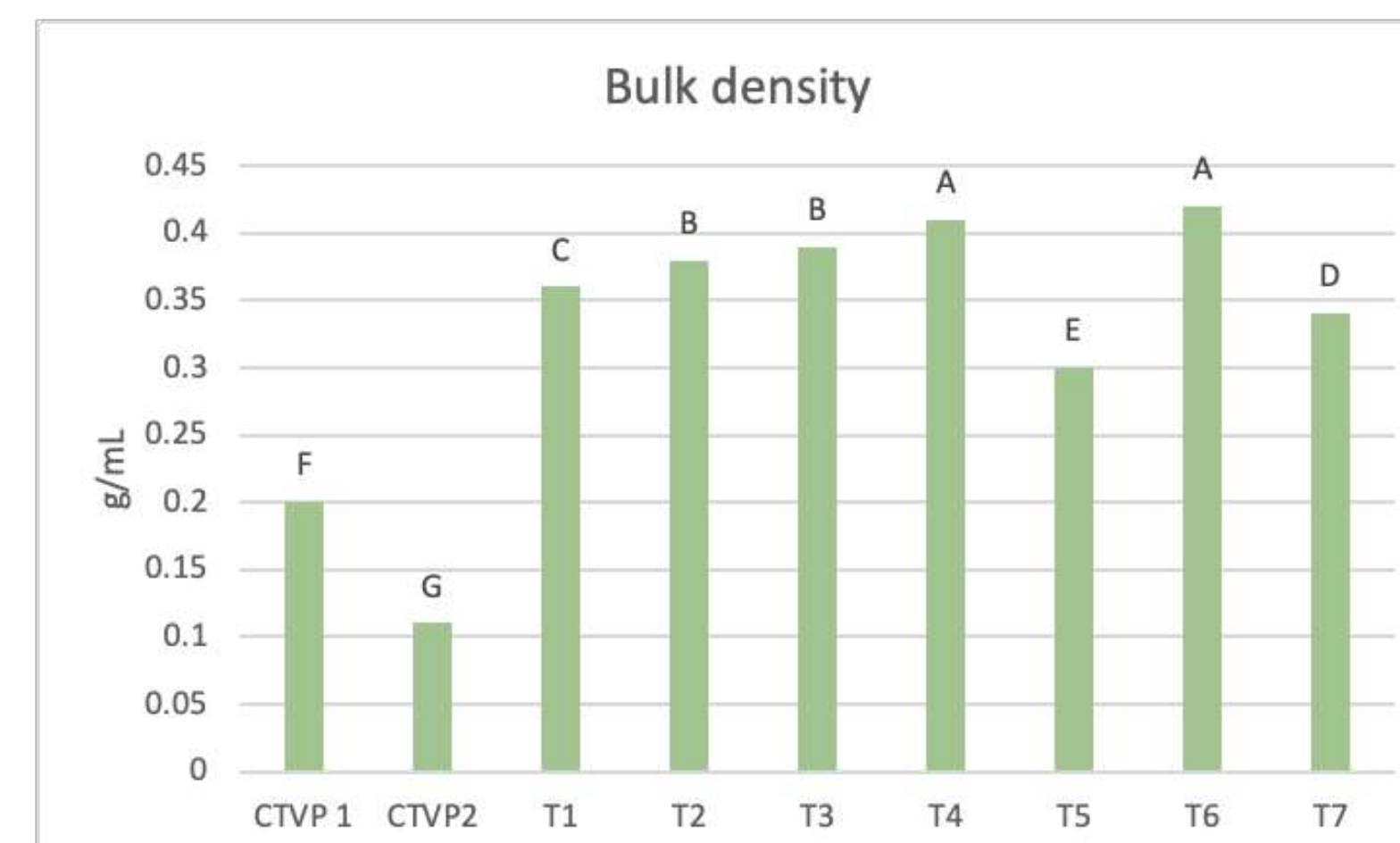
SPECIFIC MECHANICAL ENERGY

- ✓ Higher values with lower screw speed
- ✓ Affected by moisture content and temperature due to viscosity



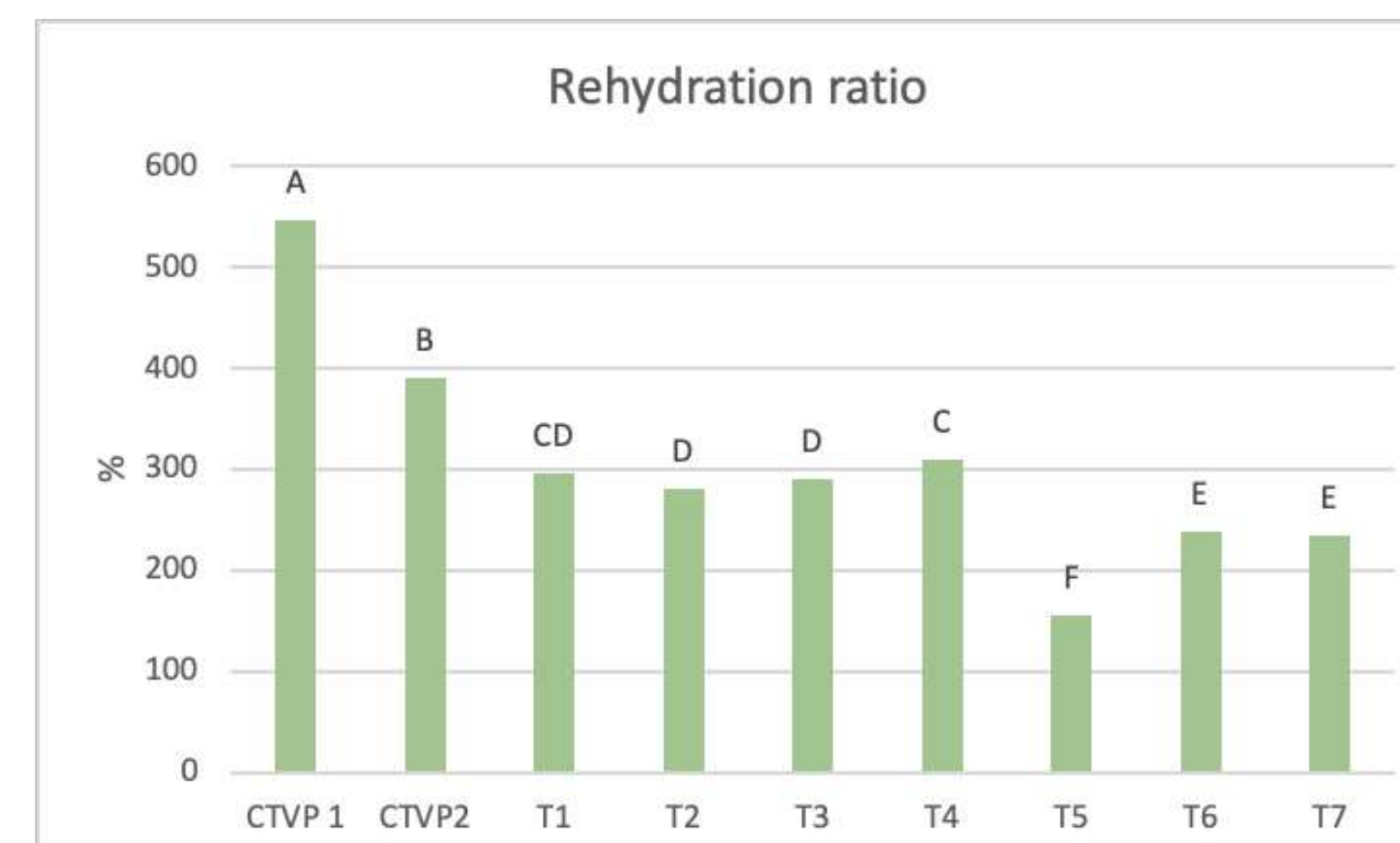
WATER & OIL HOLDING CAPACITY

- ✓ Higher WHC values were observed T1 and T2
- ✓ Higher OHC was observed for all treatments



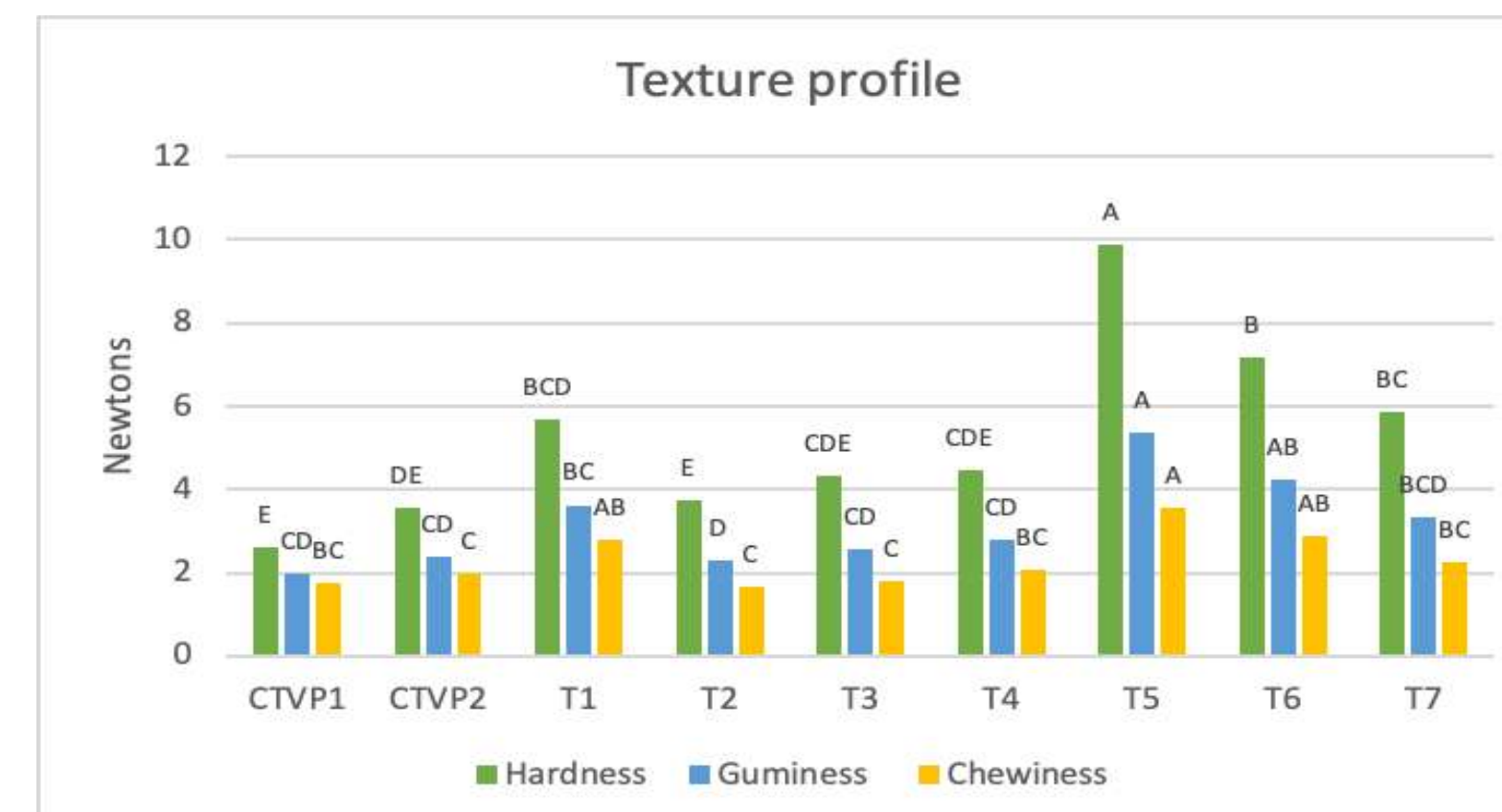
BULK DENSITY

- ✓ Mainly affected by moisture content
- ✓ Higher values with 30-35% MC



REHYDRATION RATIO

- ✓ Higher values were observed for T1 & T2
- ✓ Mainly affected by moisture content



TEXTURE PROFILE

- ✓ Increase in hardness, gumminess, and chewiness with higher moisture content
- ✓ No effect of screw speed or temperature

PROTEIN CONTENT

- ✓ Ranged from 82.67 to 84.08% (dry basis)
- ✓ Not affected by extrusion

WATER ACTIVITY

- ✓ Ranged from 0.18 to 0.23
- ✓ Fitted microbiology parameters

COLOR

- ✓ Most affected by MC% and T°C
- ✓ Decrease in brightness after extrusion
- ✓ Increase in redness and yellowness

CONCLUSION

- ✓ The combination of variables like moisture content, screw speed, and temperature affects the functional and physical properties of faba TVPs
- ✓ Based on the functional properties measured, faba TVPs are a suitable replacement for meat