

Supplementary material

Thermomechanical Stress Analysis of Hydrated Vital Gluten with Large Amplitude Oscillatory Shear Rheology

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G' —●— 25°C —●— 45°C —●— 55°C —●— 65°C —●— 70°C —●— 85°C
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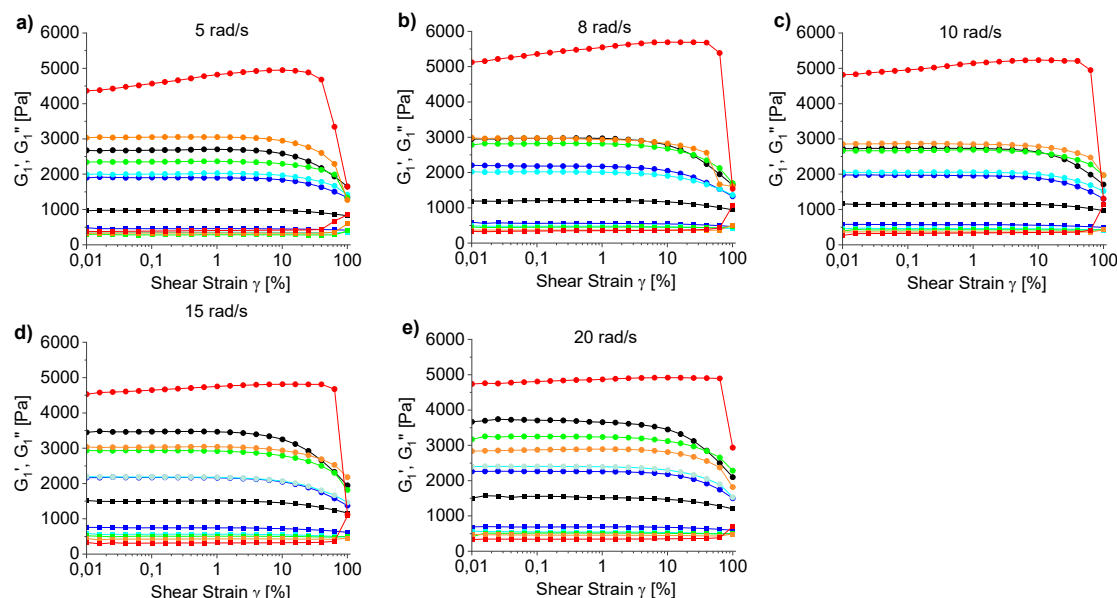


Figure S1: Fundamental rheological response of vital gluten measured at angular frequencies of 5 – 20 rad/s (a – e) and at temperatures of 25 – 85 °C (color coded).

Table S1. Critical shear strain for each conducted temperature.

T [°C]	25	45	55	65	70	85
$\sigma_{LVE \text{ left}}$ [%]	10.1 – 15,9	10.1 – 15,9	15.9 – 25.2	15.9 – 25.2	15.9 – 25.2	No clear LVE plateau for calculation

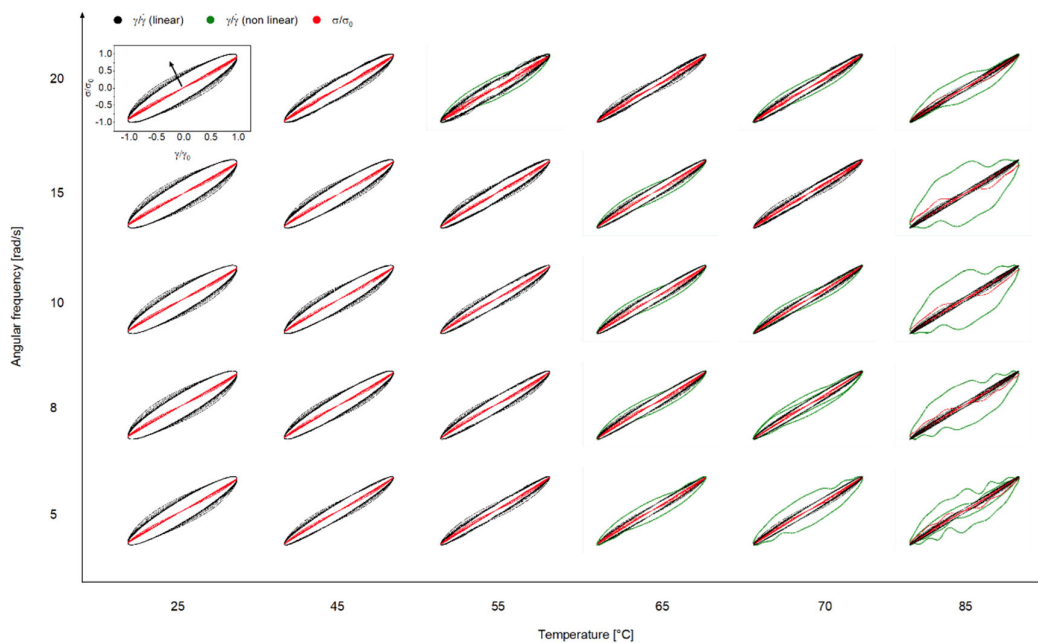


Figure S2: Normalized elastic Lissajous-Bowditch curves of hydrated gluten for all measured temperatures and angular frequencies.

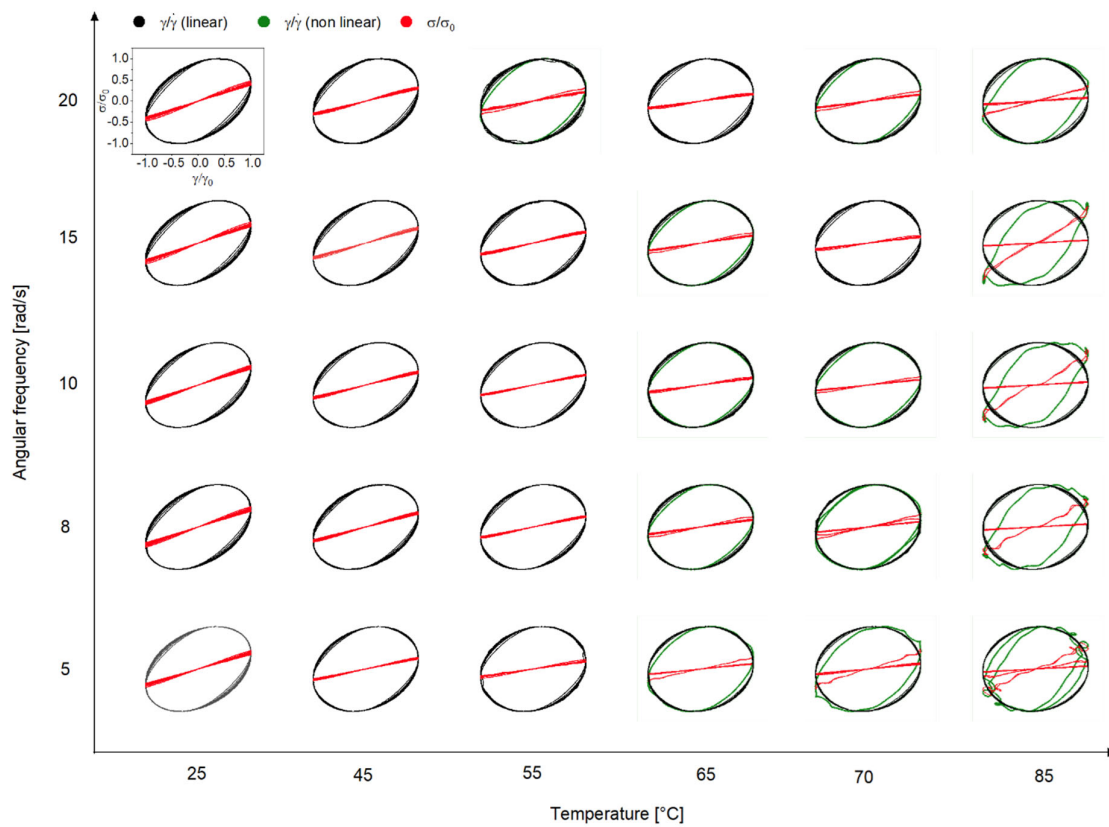


Figure S3: Normalized viscous Lissajous-Bowditch curves of hydrated gluten for all measured temperatures and angular frequencies.

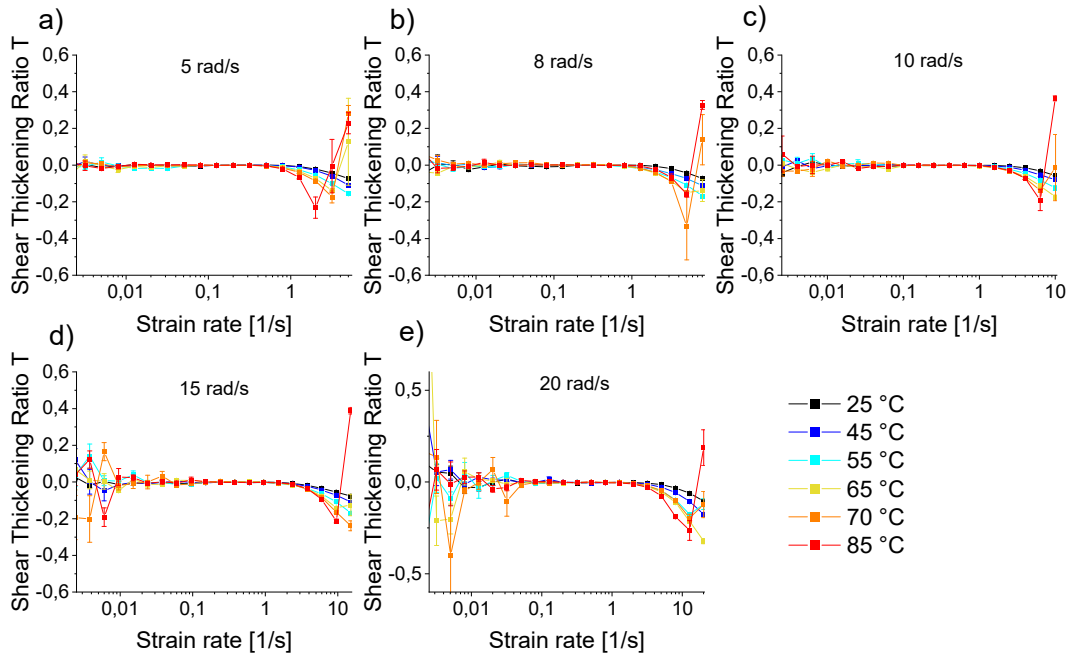


Figure S4: Shear thickening ratio T of hydrated gluten measured at various temperatures (color coded) and angular frequencies of 5 – 20 rad/s (a – e).

T is temperature- and frequency- dependent: With higher measuring temperature, the values of T are lower and the material becomes shear thinning above a strain rate of 1/s (for 5 rad/s) to 3/s (for 20 rad/s).

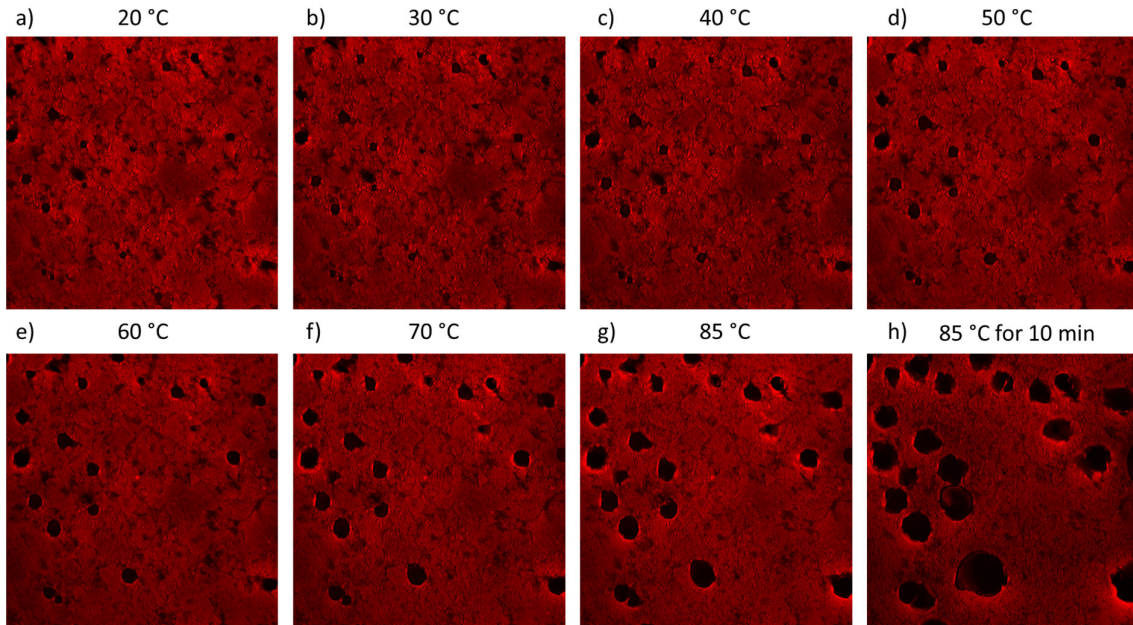


Figure S5: CLSM images of hydrated gluten at measuring temperatures of 20 – 85 °C (a – h).