# FREEZING AS A STRUCTURING PROCESS FOR PROTEIN GELS: PROCESS - STRUCTURE RELATIONSHIP, MATERIAL CHARACTERISATION, AND COMPARISON WITH MEATS

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**Supplementary material**

Table S1 Colour Analysis Results (L*, a*, b*, C*, and h°) for Different Samples

| Amostra | L* | a* | b* | C* | h° |
|---|---|---|---|---|---|
| 1 | $68.43\pm0.33^{B}$ | $5.42\pm0.02^{DE}$ | $21.95\pm0.31^{BC}$ | $22.61\pm0.31^{BC}$ | $76.13\pm0.15^{BCDE}$ |
| 2 | $62.95\pm0.44^{DE}$ | $5.74\pm0.56^{BCD}$ | $21.27\pm0.25^{BCD}$ | $22.03\pm0.25^{BCD}$ | $74.88\pm0.13^{DE}$ |
| 3 | $60.52\pm1.53^{EF}$ | $4.37\pm0.23^{F}$ | $19.18\pm0.89^{F}$ | $19.72\pm0.98^{G}$ | $74.92\pm0.63^{BC}$ |
| 4 | $56.26\pm1.23^{GH}$ | $5.12\pm0.15^{CDEF}$ | $19.53\pm0.17^{EF}$ | $20.18\pm0.16^{EFG}$ | $75.39\pm0.46^{CDE}$ |
| 5 | $68.83\pm0.58^{AB}$ | $4.98\pm0.11^{DEF}$ | $20.34\pm0.21^{CDEF}$ | $20.95\pm0.22^{CDE}$ | $76.17\pm0.16^{BCDE}$ |
| 6 | $64.83\pm0.75^{CD}$ | $5.84\pm0.16^{BC}$ | $22.30\pm0.13^{B}$ | $23.06\pm0.15^{B}$ | $75.24\pm0.32^{CDE}$ |
| 7 | $61.73\pm0.27^{E}$ | $4.72\pm0.14^{EF}$ | $19.55\pm0.44^{EG}$ | $20.12\pm0.45^{FG}$ | $76.34\pm0.28^{BCDE}$ |
| 8 | $54.03\pm0.59^{H}$ | $5.21\pm0.18^{CDE}$ | $19.78\pm0.55^{DEF}$ | $20.46\pm0.57^{DEFG}$ | $75.17\pm0.35^{CDE}$ |
| 9 | $58.12\pm0.70^{FG}$ | $5.69\pm0.30^{BCD}$ | $20.84\pm0.90^{BCDE}$ | $21.62\pm0.95^{BCDEF}$ | $74.60\pm0.20^{DE}$ |
| 10 | $58.12\pm0.67^{FG}$ | $5.83\pm0.18^{BC}$ | $21.03\pm0.53^{BCDE}$ | $21.82\pm0.54^{BCDE}$ | $74.51\pm0.37^{E}$ |
| Chicken Breast | $71.33\pm0.46^{A}$ | $2.12\pm0.27^{G}$ | $20.66\pm0.70^{CDEF}$ | $20.76\pm0.72^{DEFG}$ | $84.17\pm0.54^{A}$ |
| Fish Fillet | $66.69\pm1.03^{BC}$ | $6.35\pm0.54^{B}$ | $28.07\pm0.79^{A}$ | $28.78\pm0.72^{A}$ | $77.23\pm1.19^{B}$ |
| Sirloin Steak | $34.29\pm2.56^{I}$ | $12.30\pm0.81^{A}$ | $15.98\pm1.32^{G}$ | $20.17\pm1.41^{EFG}$ | $52.39\pm1.88^{F}$ |

Note: Results are presented as the mean ± standard deviation (SD) of four replicates. Means within the same column for each evaluated parameter followed by different letters indicate statistically significant differences ($p<0.05$).

Table S2 Results of Vertical ($F_V$) and Transverse ($F_L$) Cuts in Relation to Fibre Growth for Samples 6, 8, and 9

| Replicate | Cut Direction | S6 | S8 | S9 |
|---|---|---|---|---|
| 1 | $F_L$ | 3.18 | 3.77 | 5.43 |
| | $F_V$ | 1.33 | 1.82 | 4.49 |
| 2 | $F_L$ | 2.69 | 2.96 | 4.41 |
| | $F_V$ | 2.18 | 1.84 | 2.86 |
| 3 | $F_L$ | 2.33 | 3.39 | 5.71 |
| | $F_V$ | 1.57 | 2.02 | 4.10 |
| 4 | $F_L$ | 1.61 | 4.63 | 5.67 |
| | $F_V$ | 0.94 | 2.41 | 4.79 |
| 5 | $F_L$ | 3.28 | 4.30 | 3.77 |
| | $F_V$ | 2.26 | 2.39 | 3.00 |

| | | | | |
|---|---|---|---|---|
| 6 | $F_L$ | 2.55 | 3.08 | 3.79 |
| | $F_V$ | 1.86 | 1.65 | 2.71 |
| 7 | $F_L$ | 2.69 | 2.80 | 2.37 |
| | $F_V$ | 2.08 | 2.53 | 1.90 |
| 8 | $F_L$ | 1.86 | 5.30 | 2.12 |
| | $F_V$ | 0.82 | 4.69 | 1.12 |
| 9 | $F_L$ | 2.24 | 3.45 | 2.57 |
| | $F_V$ | 1.12 | 2.00 | 1.26 |
| 10 | $F_L$ | 2.02 | 3.53 | 2.92 |
| | $F_V$ | 1.51 | 1.94 | 2.12 |

Note: The cutting results are provided in Newtons (N) for the 10 replicates performed.