Supplementary Tables

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S1.** Proximate analysis results of unpressurised and pressurized Jack Mackerel in Day 0.  |   |   |   |   |   |   |   |
|  | **High Pressure (MPa)/time (min)** |
| (g 100g -1 muscle) | **Untreated** | **450/3** | **550/3** |
| Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **Moisture** | 74.46  | ± | 0.25 | A1 | 75.00 | ± | 0.13 | a2 | 74.93  | ± | 0.60 | A1 | 75.10 | ± | 0.30 | a1 | 74.52  | ± | 0.11 | A1 | 75.70 | ± | 0.32 | b2 |
| **Ash** | 1.20  | ± | 0.03 | A1 | 1.34  | ± | 0.02 | a2 | 1.02  | ± | 0.01 | B1 | 1.39  | ± | 0.01 | a2 | 1.05 | ± | 0.05 | B1 | 1.40  | ± | 0.09 | a2 |
| **Proteins** | 25.71  | ± | 0.31 | A1 | 26.41  | ± | 0.17 | abc2 | 27.40  | ± | 0.67 | B1 | 27.18 | ± | 0.54 | b1 | 26.79  | ± | 0.91 | AB1 | 26.15  | ± | 0.84 | ac1 |
| **Lipids** | 1.33  | ± | 0.43 | A1 | 0.83  | ± | 0.17 | a1 | 1.08  | ± | 0.46 | A1 | 1.15  | ± | 0.08 | ab1 | 0.82 | ± | 0.11 | A1 | 1.27  | ± | 0.93 | ab1 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S2.** Effect of pressurized treatments on the pH value of pre and post rigor jack mackerel.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Storage (days)** |  |  |  |  |  |  |  |  | **High Pressure (MPa)/time (min)** |
| **Untreated** | **450/3** | **550/3** |
|  | Pre rigor | Post rigor  | Pre rigor | Post rigor  | Pre rigor | Post rigor  |
| **0** | 5.89 | ± | 0.01 | A1 | 5.82 | ± | 0.02 | a2 | 5.99 | ± | 0.05 | AB1 | 5.83 | ± | 0.04 | a2 | 6.01 | ± | 0.04 | B1 | 5.93 | ± | 0.02 | b2 |
| **2** | 6.14 | ± | 0.02 | A1 | 6.36 | ± | 0.02 | a2 | 6.06 | ± | 0.17 | A1 | 6.01 | ± | 0.01 | b1 | 6.01 | ± | 0.03 | A1 | 6.08 | ± | 0.02 | c2 |
| **4** | 6.20 | ± | 0.04 | A1 | 6.47 | ± | 0.06 | a2 | 6.05 | ± | 0.02 | B1 | 6.09 | ± | 0.06 | b1 | 6.09 | ± | 0.03 | B1 | 6.05 | ± | 0.04 | b1 |
| **10** | 7.13 | ± | 0.14 | A1 | 7.20 | ± | 0.13 | a1 | 6.09 | ± | 0.02 | B1 | 6.08 | ± | 0.03 | b1 | 6.34 | ± | 0.01 | C1 | 6.23 | ± | 0.05 | c2 |
| **18** | 7.84 | ± | 0.16 | A1 | 7.65 | ± | 0.02 | a1 | 6.4 | ± | 0.02 | B1 | 6.46 | ± | 0.05 | b1 | 6.33 | ± | 0.03 | B1 | 6.24 | ± | 0.02 | c2 |
| **26** | 8.42 | ± | 0.27 | A1 | 8.12 | ± | 0.12 | a1 | 6.63 | ± | 0.09 | A1 | 6.38 | ± | 0.01 | b2 | 6.52 | ± | 0.02 | B1 | 6.29 | ± | 0.02 | c2 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S3.** Evaluation of the total volatile basic nitrogen (TVB-N) content (mg 100-1 g muscle) in unpressurized and pressurized jack mackerel in pre and post rigor stage.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Storage (days)** |  |  |  |  |  |  |  |  | **High Pressure (MPa)/time (min)** |
| **Untreated** | **450/3** | **550/3** |
|  | Pre rigor | Post rigor  | Pre rigor | Post rigor  | Pre rigor | Post rigor  |
| **0** | 18.099 | ± | 0.711 | A1 | 20.195 | ± | 0.015 | a1 | 20.568 | ± | 0.747 | B1 | 19.559 | ± | 1,059 | a1 | 21.635 | ± | 0.137 | B1 | 19.602 | ± | 0.575 | a2 |
| **2** | 19.468 | ± | 0.974 | A1 | 20.473 | ± | 1,071 | a1 | 22.033 | ± | 1,071 | AB1 | 21.521 | ± | 0.105 | ab1 | 21.004 | ± | 0.194 | B1 | 21.795 | ± | 0.463 | b1 |
| **4** | 23.854 | ± | 0.864 | A1 | 26.670 | ± | 1,011 | a2 | 21.928 | ± | 0.749 | A1 | 21.015 | ± | 1,087 | a1 | 20.929 | ± | 0.797 | B1 | 22.062 | ± | 1,088 | b1 |
| **10** | 38.941 | ± | 0.976 | A1 | 42.002 | ± | 1,117 | a2 | 24.522 | ± | 0.086 | B1 | 24.644 | ± | 0.017 | b2 | 26.176 | ± | 0.019 | C1 | 27.166 | ± | 1,087 | c1 |
| **18** | 47.203 | ± | 1,088 | A1 | 54.880 | ± | 1,011 | a2 | 26.184 | ± | 0.019 | B1 | 35.379 | ± | 0.050 | b2 | 28.218 | ± | 1,028 | C1 | 27.715 | ± | 0.020 | c1 |
| **26** | 76.018 | ± | 1,029 | A1 | 92.584 | ± | 0.342 | a2 | 67.099 | ± | 1,371 | B1 | 52.299 | ± | 0.074 | b2 | 52.334 | ± | 0.111 | C1 | 53.361 | ± | 1,200 | c1 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S4.** TMA-N (mg 100 g) analysis results of unpressurized and pressurized jack mackerel in pre and post-rigor.

|  |  |  |
| --- | --- | --- |
| **Storage (days)** | **Untreated** | **High Pressure (MPa)/time (min)** |
| **450/3** | **550/3** |
|  | Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **0** | 0.49 | ± | 0.02 | AB1 | 1.02 | ± | 0.07 | a2 | 0.31 | ± | 0.05 | AB1 | 1.13 | ± | 0.14 | a1 | 0.44 | ± | 0.16 | B1 | 1.11 | ± | 0.26 | a1 |
| **2** | 0.39 | ± | 0.09 | A1 | 1.09 | ± | 0.06 | a2 | 0.28 | ± | 0.01 | B1 | 1.23 | ± | 0.03 | a1 | 0.37 | ± | 0.10 | AB1 | 1.28 | ± | 0.09 | a1 |
| **4** | 1.33 | ± | 0.15 | A1 | 2.15 | ± | 0.11 | a2 | 1.22 | ± | 0.09 | AB1 | 1.45 | ± | 0.06 | b1 | 1.31 | ± | 0.22 | B1 | 1.09 | ± | 0.10 | bc1 |
| **10** | 6.25 | ± | 0.20 | A1 | 6.66 | ± | 0.77 | a1 | 4.29 | ± | 0.04 | B1 | 4.59 | ± | 0.01 | b2 | 4.30 | ± | 0.09 | D1 | 3.83 | ± | 0.08 | b1 |
| **18** | 9.34 | ± | 0.36 | A1 | 11.30 | ± | 0.72 | a2 | 4.41 | ± | 0.14 | B1 | 5.45 | ± | 0.10 | b2 | 5.03 | ± | 0.17 | C1 | 5.85 | ± | 0.16 | b2 |
| **26** | 22.92 | ± | 0.79 | A1 | 22.22 | ± | 0.43 | a1 | 4.81 | ± | 0.05 | B1 | 5.38 | ± | 0.25 | b2 | 5.18 | ± | 0.23 | B1 | 5.18 | ± | 0.30 | b2 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S5.** Color analysis results of unpressurized and pressurized jack mackerel in pre and post rigor.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Storage (days)** | **Untreated** | **450MPa/3min** | **550MPa/3min** |
|  | Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **L\*** | **0** | 39.78 | ± | 1.43 | A1 | 38.24 | ± | 1.16 | a1 | 63.74 | ± | 1.56 | B1 | 64.45 | ± | 0.87 | b2 | 63.57 | ± | 0.72 | B1 | 67.18 | ± | 2.10 | b2 |
| **2** | 42.33 | ± | 0.10 | A1 | 39.98 | ± | 0.81 | a2 | 63.28 | ± | 1.24 | B1 | 61.62 | ± | 1.41 | b1 | 63.65 | ± | 0.42 | BC1 | 65.23 | ± | 0.71 | c2 |
| **4** | 37.48 | ± | 1.66 | A1 | 34.77 | ± | 1.03 | a1 | 59.99 | ± | 0.46 | B1 | 59.56 | ± | 1.31 | b1 | 60.75 | ± | 1.09 | B1 | 59.17 | ± | 0.78 | b1 |
| **10** | 41.78 | ± | 2.08 | A1 | 38.07 | ± | 2.32 | a1 | 56.21 | ± | 0.82 | B1 | 56.16 | ± | 0.66 | b1 | 59.83 | ± | 0.33 | C1 | 59.3 | ± | 1.02 | c1 |
| **18** | 44.2 | ± | 0.78 | A1 | 44.2 | ± | 0.78 | a1 | 61.14 | ± | 1.36 | B1 | 55.16 | ± | 0.42 | b2 | 60.15 | ± | 2.63 | B1 | 60.45 | ± | 1.60 | c1 |
| **26** | 41.6 | ± | 0.53 | A1 | 47.22 | ± | 1.03 | a2 | 59.38 | ± | 1.17 | BC1 | 54.53 | ± | 1.40 | b2 | 59.83 | ± | 0.82 | BC1 | 57.77 | ± | 1.03 | d1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **a\*** | **0** | 4.51 | ± | 0.76 | A1 | 7.38 | ± | 0.94 | a2 | -0.59 | ± | 0.61 | B1 | 3.61 | ± | 1.48 | b2 | 0.8 | ± | 0.19 | C1 | 1.36 | ± | 0.19 | c2 |
| **2** | 4.53 | ± | 0.25 | A1 | 3.9 | ± | 0.43 | a1 | 0.46 | ± | 0.83 | B1 | 0.6 | ± | 0.20 | b1 | 1.03 | ± | 0.17 | B1 | 1.11 | ± | 0.61 | b1 |
| **4** | 6.77 | ± | 0.90 | A1 | 7.87 | ± | 0.34 | a1 | 1.37 | ± | 0.32 | BC1 | 3.11 | ± | 0.72 | bd2 | 2.09 | ± | 0.39 | C1 | 1.74 | ± | 0.10 | c1 |
| **10** | 8.34 | ± | 1.13 | A1 | 8.45 | ± | 0.77 | a1 | 1.64 | ± | 0.50 | B1 | 2.82 | ± | 0.68 | b1 | 1.41 | ± | 0.53 | B1 | 2.26 | ± | 0.39 | b1 |
| **18** | 5.87 | ± | 0.89 | A1 | 5.87 | ± | 0.89 | a1 | 1.8 | ± | 0.60 | B1 | 2.45 | ± | 0.21 | b1 | 2.31 | ± | 0.64 | B1 | 2.18 | ± | 0.39 | b1 |
| **26** | 6.83 | ± | 0.27 | A1 | 6.84 | ± | 0.47 | a1 | 2.51 | ± | 0.36 | B1 | 2.73 | ± | 0.79 | b1 | 4.65 | ± | 0.33 | C1 | 4.67 | ± | 0.06 | c1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **b\*** | **0** | 10.24 | ± | 1.06 | A1 | 12.08 | ± | 0.44 | ab1 | 15.51 | ± | 0.55 | B1 | 13.41 | ± | 0.98 | b2 | 15.36 | ± | 0.13 | B1 | 12.51 | ± | 1.02 | ab2 |
| **2** | 13.74 | ± | 0.07 | A1 | 12.48 | ± | 0.66 | a2 | 11.71 | ± | 1.05 | B1 | 12.65 | ± | 1.08 | a1 | 13.67 | ± | 1.43 | A1 | 12.67 | ± | 0.57 | a1 |
| **4** | 10.95 | ± | 0.95 | A1 | 12.88 | ± | 0.08 | ab2 | 12.43 | ± | 0.34 | AB1 | 13.68 | ± | 1.09 | abc1 | 13.1 | ± | 0.77 | B1 | 12.54 | ± | 0.71 | a1 |
| **10** | 13.71 | ± | 1.10 | AB1 | 12.44 | ± | 1.19 | a1 | 12.83 | ± | 0.66 | A1 | 14.69 | ± | 0.64 | b2 | 14.13 | ± | 0.45 | B1 | 15 | ± | 0.88 | b1 |
| **18** | 13.32 | ± | 0.93 | AB1 | 13.32 | ± | 0.93 | a1 | 14.43 | ± | 0.53 | B1 | 12.58 | ± | 0.93 | a1 | 16.72 | ± | 1.09 | C1 | 17.7 | ± | 0.63 | c1 |
| **26** | 13.66 | ± | 0.28 | A1 | 14.26 | ± | 0.92 | ac1 | 15.23 | ± | 0.45 | BC1 | 13.37 | ± | 0.74 | a2 | 15.29 | ± | 1.34 | BC1 | 15.1 | ± | 0.41 | bc1 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S6.** WHC values results from unpressurized and pressurized jack mackerel in pre- and post-rigor.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   |  |  |  |  |  |  |  |  | **High Pressure (MPA)/time(min)** |
| **Storage****(days)** | **Untreated** | **450MPa 3min** | **550MPa 3 min** |
| Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **0** | 99.73 | ± | 0.05 | A1 | 99.63 | ± | 0.15 | a1 | 99.71 | ± | 0.05 | A1 | 99.58 | ± | 0.05 | a2 | 99.53 | ± | 0.08 | B1 | 99.66 | ± | 0.04 | a1 |
| **2** | 99.69 | ± | 0.04 | AC1 | 99.64 | ± | 0.04 | a1 | 99.57 | ± | 0.02 | B1 | 99.64 | ± | 0.09 | a1 | 99.71 | ± | 0.04 | C1 | 99.75 | ± | 0.07 | a1 |
| **4** | 99.66 | ± | 0.03 | A1 | 99.62 | ± | 0.03 | a1 | 99.6 | ± | 0.03 | A1 | 99.63 | ± | 0.02 | a1 | 99.7 | ± | 0.03 | A1 | 99.68 | ± | 0.04 | a1 |
| **10** | 99.57 | ± | 0.01 | A1 | 99.55 | ± | 0.02 | a1 | 99.56 | ± | 0.01 | B1 | 99.63 | ± | 0.02 | a1 | 99.68 | ± | 0.01 | A1 | 99.62 | ± | 0.05 | a1 |
| **18** | 99.49 | ± | 0.02 | A1 | 99.43 | ± | 0.05 | a1 | 99.68 | ± | 0.07 | A1 | 99.67 | ± | 0.03 | a1 | 99.74 | ± | 0.05 | A1 | 99.65 | ± | 0.01 | a1 |
| **26** | 99.31 | ± | 0.07 | A1 | 99.48 | ± | 0.04 | a1 | 99.64 | ± | 0.04 | A1 | 99.64 | ± | 0.05 | a1 | 99.7 | ± | 0.05 | A1 | 99.69 | ± | 0.08 | a1 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S7.** Texture analysis results for unpressurized and pressurized jack mackerel in pre and post rigor.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  | **High pressure/time** |
| **Storage (days)** |  | **Untreated** | **450MPa 3min** | **550MPa 3 min** |
|   | Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **0** | **Fracturability (N)** | 4.47 |  | 2.27 | A1 | 8.82 |  | 3.42 | ab1 | 8.68 |  | 1.87 | A1 | 14.23 |  | 2.21 | b2 | 10.90 |  | 1.77 | AB1 | 4.64 |  | 0.39 | a2 |
| **2** | 6.88 |  | 4.24 | A1 | 9.37 |  | 2.80 | a1 | 13.30 |  | 1.70 | B1 | 10.66 |  | 4.25 | a1 | 28.59 |  | 5.03 | C1 | 10.42 |  | 1.35 | a2 |
| **4** | 6.96 |  | 6.15 | A1 | 25.05 |  | 4.82 | a2 | 7.76 |  | 1.99 | AB1 | 17.85 |  | 2.46 | b2 | 14.26 |  | 3.50 | B1 | 10.11 |  | 7.63 | c1 |
| **10** | 5.99 |  | 0.70 | A1 | 10.49 |  | 4.45 | a1 | 19.96 |  | 7.30 | B1 | 9.84 |  | 3.23 | a2 | 18.36 |  | 4.58 | B1 | 6.54 |  | 1.89 | a2 |
| **18** | 9.59 |  | 5.53 | A1 | 5.72 |  | 2.31 | a1 | 7.48 |  | 2.89 | A1 | 12.51 |  | 1.94 | b1 | 10.14 |  | 0.71 | A1 | 7.62 |  | 0.42 | a2 |
| **30** | 5.61 |  | 2.66 | AB1 | 11.68 |  | 3.10 | a2 | 5.57 |  | 2.04 | B1 | 11.67 |  | 3.23 | a2 | 8.06 |  | 2.65 | AB1 | 9.07 |  | 5.41 | a1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **0** | **Springiness (mm)** | 0.67 |  | 0.14 | A1 | 0.72 |  | 0.10 | a1 | 0.78 |  | 0.03 | A1 | 0.74 |  | 0.06 | a1 | 0.72 |  | 0.03 | A1 | 0.75 |  | 0.07 | a1 |
| **2** | 0.57 |  | 0.02 | A1 | 0.77 |  | 0.05 | a2 | 0.81 |  | 0.08 | B1 | 0.77 |  | 0.11 | a1 | 0.78 |  | 0.11 | B1 | 0.75 |  | 0.04 | a1 |
| **4** | 0.75 |  | 0.10 | A1 | 0.55 |  | 0.12 | a2 | 0.70 |  | 0.03 | A1 | 0.68 |  | 0.10 | ab1 | 0.73 |  | 0.06 | A1 | 0.78 |  | 0.08 | b1 |
| **10** | 0.67 |  | 0.08 | AB1 | 0.56 |  | 0.05 | a2 | 0.65 |  | 0.06 | AB1 | 0.77 |  | 0.11 | b1 | 0.76 |  | 0.07 | B1 | 0.75 |  | 0.10 | b1 |
| **18** | 0.70 |  | 0.05 | A1 | 0.59 |  | 0.12 | a1 | 0.71 |  | 0.09 | A1 | 0.78 |  | 0.06 | b1 | 0.72 |  | 0.08 | A1 | 0.77 |  | 0.06 | b1 |
| **30** | 0.64 |  | 0.04 | A1 | 0.60 |  | 0.06 | a1 | 0.57 |  | 0.01 | AB1 | 0.69 |  | 0.04 | ab2 | 0.52 |  | 0.07 | AB1 | 0.69 |  | 0.07 | ab2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **0** | **Cohesiveness** | 0.57 |  | 0.06 | A1 | 0.62 |  | 0.03 | a1 | 0.70 |  | 0.02 | B1 | 0.63 |  | 0.05 | a2 | 0.70 |  | 0.03 | B1 | 0.66 |  | 0.05 | a1 |
| **2** | 0.55 |  | 0.05 | A1 | 0.69 |  | 0.03 | a2 | 0.62 |  | 0.04 | B1 | 0.67 |  | 0.03 | a2 | 0.66 |  | 0.07 | BC1 | 0.62 |  | 0.04 | b1 |
| **4** | 0.60 |  | 0.08 | A1 | 0.41 |  | 0.08 | a2 | 0.57 |  | 0.05 | A1 | 0.42 |  | 0.10 | ab2 | 0.58 |  | 0.06 | A1 | 0.67 |  | 0.12 | c1 |
| **10** | 0.63 |  | 0.03 | A1 | 0.56 |  | 0.04 | a2 | 0.60 |  | 0.05 | A1 | 0.63 |  | 0.04 | b1 | 0.53 |  | 0.01 | A1 | 0.67 |  | 0.07 | bc2 |
| **18** | 0.64 |  | 0.02 | AC1 | 0.58 |  | 0.02 | a2 | 0.63 |  | 0.08 | AB1 | 0.62 |  | 0.10 | ab1 | 0.60 |  | 0.01 | B1 | 0.67 |  | 0.07 | b2 |
| **30** | 0.65 |  | 0.01 | A1 | 0.62 |  | 0.08 | a1 | 0.55 |  | 0.06 | A1 | 0.57 |  | 0.01 | b1 | 0.59 |  | 0.03 | A1 | 0.58 |  | 0.07 | ab1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **0** | **Resilience** | 0.24 |  | 0.06 | A1 | 0.24 |  | 0.04 | a1 | 0.32 |  | 0.01 | B1 | 0.24 |  | 0.04 | a2 | 0.28 |  | 0.05 | AB1 | 0.27 |  | 0.03 | ab1 |
| **2** | 0.23 |  | 0.02 | A1 | 0.26 |  | 0.01 | a2 | 0.25 |  | 0.02 | A1 | 0.25 |  | 0.01 | a1 | 0.32 |  | 0.03 | BC1 | 0.22 |  | 0.03 | b2 |
| **4** | 0.26 |  | 0.06 | A1 | 0.17 |  | 0.04 | ac2 | 0.21 |  | 0.02 | AB1 | 0.15 |  | 0.05 | a2 | 0.23 |  | 0.04 | AB1 | 0.23 |  | 0.04 | bc1 |
| **10** | 0.24 |  | 0.02 | AC1 | 0.23 |  | 0.02 | a1 | 0.23 |  | 0.03 | ABC1 | 0.25 |  | 0.03 | ab1 | 0.19 |  | 0.01 | AB1 | 0.26 |  | 0.03 | ab2 |
| **18** | 0.27 |  | 0.04 | AC1 | 0.19 |  | 0.02 | a2 | 0.25 |  | 0.03 | ABC1 | 0.24 |  | 0.04 | b1 | 0.24 |  | 0.01 | B1 | 0.27 |  | 0.02 | c2 |
| **30** | 0.27 |  | 0.02 | A1 | 0.26 |  | 0.03 | a1 | 0.18 |  | 0.03 | A1 | 0.19 |  | 0.01 | b1 | 0.20 |  | 0.02 | A1 | 0.20 |  | 0.04 | b1 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.

**Table S8.** Breaking deformation(mm) results of unpressurized and pressurized Jack mackerel in pre and post rigor.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  | **High Pressure /time**  |
| **Storage****(days)** | **Untreated** | **450MPa 3min** | **550MPa 3 min** |
| Pre rigor | Post rigor | Pre rigor | Post rigor | Pre rigor | Post rigor |
| **0** | 7.74 | ± | 1.66 | AB1 | 5.13 | ± | 1.01 | a2 | 9.08 | ± | 2.54 | A1 | 5.63 | ± | 0.67 | a2 | 5.95 | ± | 1.18 | B1 | 3.41 | ± | 1.55 | b2 |
| **2** | 4.86 | ± | 1.26 | AB1 | 5.51 | ± | 1.05 | ac1 | 4.35 | ± | 0.93 | A1 | 5.09 | ± | 0.24 | a2 | 4.66 | ± | 1.13 | AB1 | 6.43 | ± | 1.16 | bc2 |
| **4** | 5.44 | ± | 0.85 | A1 | 5.07 | ± | 0.55 | ab1 | 5.80 | ± | 0.54 | A1 | 5.35 | ± | 1.41 | bc1 | 6.27 | ± | 0.89 | A1 | 4.53 | ± | 0.76 | a2 |
| **10** | 6.01 | ± | 2.12 | A1 | 5.81 | ± | 0.84 | ac1 | 8.07 | ± | 1.09 | B1 | 4.98 | ± | 1.89 | ab2 | 7.53 | ± | 1.27 | B1 | 4.63 | ± | 1.86 | b2 |
| **18** | 7.41 | ± | 2.41 | A1 | 5.73 | ± | 1.47 | a2 | 3.75 | ± | 0.85 | B1 | 2.27 | ± | 0.48 | b2 | 4.79 | ± | 0.84 | B1 | 4.79 | ± | 1.11 | a1 |
| **26** | 10.17 | ± | 0.90 | A1 | 10.26 | ± | 2.03 | a1 | 5.66 | ± | 0.79 | BC1 | 7.39 | ± | 0.84 | b2 | 8.69 | ± | 2.02 | A1 | 7.72 | ± | 0.46 | b2 |

Data is shown as mean ± standard deviation and different letters within the same row imply significant differences (p < 0.05).

Different letters (A, B, C) indicate significant differences (p < 0.05) for pre-rigor and a, b, c for post-rigor jack mackerel compared to the control sample.

Different numbers (1, 2) indicate significant differences between the pre- and post-rigor stages.