**Supplementary Information Items**

This research study contains supplementary files below available to readers.

**Supplementary Table 1.** Effect of ozonation, packaging and storage time on tomato fruit resistance to penetration (mean±SD)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Treatments** | | | | | | |
|  | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1ppm O3 | 1ppm O3-LDPE | 2ppm O3 | 2 ppm O3-LDPE |
| 0 | 16.27±0.87 | 16.27±0.87 | 16.27±0.87 | 16.27±0.87 | 16.27±0.87 | 16.27±0.87 | 16.27±0.87 |
| 7 | 14.59±0.86 | 14.70±0.83 | 14.94±0.79 | 15.23±0.84 | 15.54±0.80 | 15.77±0.81 | 16.19±0.82 |
| 14 | 11.14±0.42 | 12.01±0.43 | 12.91±0.40 | 13.80±0.45 | 14.65±0.37 | 15.41±0.32 | 16.08±0.33 |
| 21 | 9.64±0.29 | 11.75±0.26 | 12.54±0.27 | 13.28±0.28 | 14.16±0.26 | 14.79±0.28 | 15.44±0.30 |
| 28 | 8.96±0.32 | 11.13±0.28 | 11.86±0.25 | 12.88±0.21 | 13.58±0.28 | 14.12±0.21 | 14.83±0.25 |
| 35 | 7.32±0.31 | 9.93±0.26 | 10.69±0.27 | 12.37±0.22 | 12.99±0.27 | 13.61±0.25 | 14.14±0.22 |
| 42 | - | 9.36±0.24 | 10.38±0.26 | 11.95±0.28 | 12.48±0.21 | 12.98±0.23 | 13.52±0.25 |
| 49 | - | 8.88±0.21 | 9.42±0.24 | 10.79±0.26 | 11.32±0.23 | 11.83±0.22 | 12.77±0.29 |
| t | 4.004 | 12.851 | 15.048 | 21.274 | 24.116 | 26.970 | 31.870 |
| df | 5 | 7 | 7 | 7 | 7 | 7 | 7 |
| *p* | *<0.01* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* |

Mean: average value of six replicates, SD: standard deviation, comparison of means using *T-test* at the significance level *p<0.05,* df: degrees of freedom.

**Supplementary Table 2a.** Effect of ozonation, packaging and storage time on tomato texture scores (mean±SD)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Treatments** | | | | | | |
|  | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1ppm O3 | 1ppm O3-LDPE | 2ppm O3 | 2ppm O3-LDPE |
| 0 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 |
| 7 | 5.0±0.4 | 5.0±0.5 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 |
| 14 | 4.8±0.3 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 |
| 21 | 4.2±0.4 | 4.8±0.4 | 4.8±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 |
| 28 | 3.6±0.2 | 4.4±0.4 | 4.5±0.4 | 4.6±0.5 | 4.7±0.5 | 4.8±0.5 | 5.0±0.5 |
| 35 | 3.1±0.2 | 3.7±0.3 | 4.0±0.4 | 4.1±0.4 | 4.2±0.5 | 4.3±0.5 | 4.4±0.5 |
| 42 | - | 3.6±0.4 | 3.7±0.4 | 3.8±0.4 | 4.0±0.4 | 4.1±0.4 | 4.1±0.4 |
| 49 | - | 3.3±0.4 | 3.3±0.4 | 3.5±0.4 | 3.6±0.4 | 3.7±0.4 | 3.8±0.4 |
| t | 4.340 | 17.253 | 18.728 | 20.647 | 23.938 | 25.524 | 26.770 |
| df | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *<0.01* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* |

Mean: average values of a ten member sensory panel, SD: standard deviation values, comparison of means using *T-test* at the significance level *p<0.05,* df: degrees of freedom

**Supplementary Table 2b.** Effect of ozonation, packaging and storage time on tomato taste scores (mean±SD)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Treatments** | | | | | | |
|  | Control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1 ppm O3 | 1ppm O3-LDPE | 2ppm O3 | 2ppm O3-LDPE |
| 0 | 5.0±0.5 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.5 |
| 7 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 |
| 14 | 4.2±0.4 | 4.6±0.4 | 4.8±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 |
| 21 | 3.6±0.3 | 4.4±0.4 | 4.5±0.4 | 4.8±0.4 | 4.8±0.4 | 4.8±0.4 | 4.8±0.5 |
| 28 | 3.3±0.3 | 4.1±0.4 | 4.3±0.4 | 4.6±0.4 | 4.6±0.5 | 4.7±0.4 | 4.7±0.4 |
| 35 | 2.8±0.2 | 3.6±0.4 | 3.8±0.4 | 3.9±0.4 | 4.1±0.4 | 4.2±0.4 | 4.4±0.5 |
| 42 | - | 3.4±0.3 | 3.6±0.3 | 3.7±0.3 | 3.8±0.3 | 3.8±0.3 | 3.9±0.3 |
| 49 | - | 3.2±0.3 | 3.3±0.3 | 3.5±0.3 | 3.5±0.3 | 3.6±0.3 | 3.7±0.3 |
| t | 4.230 | 16.701 | 18.497 | 19.779 | 21.201 | 22.419 | 25.043 |
| df | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *<0.01* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* |

Mean: average values of a ten member sensory panel, SD: standard deviation values , comparison of means using *T-test* at the significance level *p<0.05,* df: degrees of freedom

**Supplementary Table 2c.** Effect of ozonation, packaging and storage time on tomato aroma scores (mean±SD)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Days** | **Treatments** | | | | | | |
|  | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1 ppm O3 | 1 ppm O3-LDPE | 2 ppm O3 | 2 ppm O3-LDPE |
| 0 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 | 5.0±0.5 |
| 7 | 5.0±0.4 | 5.0±0.5 | 5.0±0.5 | 5.0±0.4 | 5.0±0.4 | 5.0±0.5 | 5.0±0.4 |
| 14 | 4.4±0.5 | 4.8±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 | 5.0±0.4 |
| 21 | 3.9±0.3 | 4.7±0.4 | 4.8±0.4 | 4.8±0.4 | 4.8±0.4 | 4.8±0.5 | 4.8±0.4 |
| 28 | 3.3±0.2 | 4.5±0.4 | 4.5±0.4 | 4.6±0.3 | 4.6±0.3 | 4.7±0.4 | 4.7±0.4 |
| 35 | 3.1±0.2 | 3.8±0.4 | 3.9±0.4 | 4.0±0.4 | 4.1±0.4 | 4.2±0.4 | 4.3±0.3 |
| 42 | - | 3.7±0.4 | 3.7±0.4 | 3.9±0.3 | 3.9±0.4 | 4.0±0.3 | 4.0±0.3 |
| 49 | - | 3.4±0.3 | 3.5±0.3 | 3.6±0.4 | 3.7±0.4 | 3.7±0.3 | 3.8±0.4 |
| t | 4.305 | 19.945 | 19.807 | 22.295 | 23.826 | 25.101 | 26.940 |
| df | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *<0.01* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* | *<0.001* |

Mean: average values of a ten member sensory panel, SD: standard deviation values, comparison of means using *T-test* at the significance level *p<0.05,*  df: degrees of freedom

**Supplementary Table 3a.** Microbial growth rate (mean values) of TVC with respect to treatment and storage time

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Days | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1 ppm O3 | 1 ppm O3-LDPE | 2 ppm O3 | 2 ppm O3-LDPE |
| 0-7 | 0.49 | 0.46 | 0.44 | 0.41 | 0.39 | 0.35 | 0.31 |
| 7-14 | 0.22 | 0.20 | 0.18 | 0.17 | 0.14 | 0.15 | 0.09 |
| 14-21 | 0.15 | 0.15 | 0.06 | 0.14 | 0.10 | 0.07 | 0.10 |
| 21-28 | 0.12 | 0.09 | 0.15 | 0.10 | 0.07 | 0.12 | 0.08 |
| 28-35 | 0.06 | 0.05 | 0.08 | 0.04 | 0.05 | 0.05 | 0.04 |
| 35-41 | - | 0.04 | 0.03 | 0.02 | 0.02 | 0.01 | 0.04 |
| 41-49 | - | 0.02 | 0.02 | 0.02 | 0.05 | 0.02 | 0.01 |
| t | 2.783 | 2.498 | 2.476 | 2.458 | 2.442 | 2.480 | 2.510 |
| df | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* |

Comparison of means using *T-test* at the significance level *p<0.05,*  df: degrees of freedom .

**Supplementary Table 3b.** Microbial growth rate (mean values) of psychrotrophic counts with respect to treatment and storage time

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Days | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1 ppm O3 | 1 ppm O3-LDPE | 2 ppm O3 | 2 ppm O3-LDPE |
| 0-7 | 0.44 | 0.43 | 0.38 | 0.35 | 0.29 | 0.20 | 0.15 |
| 7-14 | 0.15 | 0.13 | 0.08 | 0.09 | 0.10 | 0.07 | 0.10 |
| 14-21 | 0.08 | 0.08 | 0.11 | 0.08 | 0.09 | 0.10 | 0.07 |
| 21-28 | 0.15 | 0.06 | 0.08 | 0.09 | 0.08 | 0.12 | 0.10 |
| 28-35 | 0.21 | 0.19 | 0.16 | 0.14 | 0.14 | 0.15 | 0.14 |
| 35-41 |  | 0.03 | 0.03 | 0.04 | 0.02 | 0.05 | 0.03 |
| 41-49 |  | 0.02 | 0.03 | 0.06 | 0.04 | 0.02 | 0.05 |
| t | 3.251 | 2.456 | 2.694 | 2.981 | 3.297 | 4.438 | 5.383 |
| df | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.01* | *p<0.01* |

Comparison of means using *T-test* at the significance level *p<0.05,*  df: degrees of freedom .

**Supplementary Table 3c.** Microbial growth rate (mean values) of yeasts and molds with respect to treatment and storage time

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Days | control | 0.5ppm O3 | 0.5ppm O3-LDPE | 1 ppm O3 | 1 ppm O3-LDPE | 2 ppm O3 | 2 ppm O3-LDPE |
| 0-7 | 0.32 | 0.31 | 0.29 | 0.28 | 0.25 | 0.20 | 0.14 |
| 7-14 | 0.20 | 0.15 | 0.08 | 0.07 | 0.07 | 0.03 | 0.03 |
| 14-21 | 0.07 | 0.06 | 0.08 | 0.05 | 0.04 | 0.09 | 0.06 |
| 21-28 | 0.09 | 0.06 | 0.09 | 0.08 | 0.06 | 0.06 | 0.09 |
| 28-35 | 0.15 | 0.09 | 0.04 | 0.08 | 0.09 | 0.08 | 0.07 |
| 35-41 |  | 0.09 | 0.10 | 0.04 | 0.07 | 0.07 | 0.09 |
| 41-49 |  | 0.02 | 0.09 | 0.12 | 0.08 | 0.09 | 0.08 |
| t | 3.728 | 3.007 | 3.516 | 3.37 | 3.622 | 4.328 | 6.499 |
| df | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| *p* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.05* | *p<0.01* | *p<0.01* |

Comparison of means using *T-test* at the significance level *p<0.05,*  df: degrees of freedom .

**Estimation of the parameters of the microbial growth modeling-Equations**

*R*-squared can be defined as follows:

*R2 = 1 – SSresid/SSmodel + SSresid= 1 + SSerror/SStotal* (Eq.1)

The *R*pred2 and the *R*adj2 have been obtained using Eqs. (2) and (3).

*R2adj= 1 – (n – 1/n – p) (SSerror/SStotal) = 1 − (n − 1)/(n = p)(1 − R2)* (Eq.2)

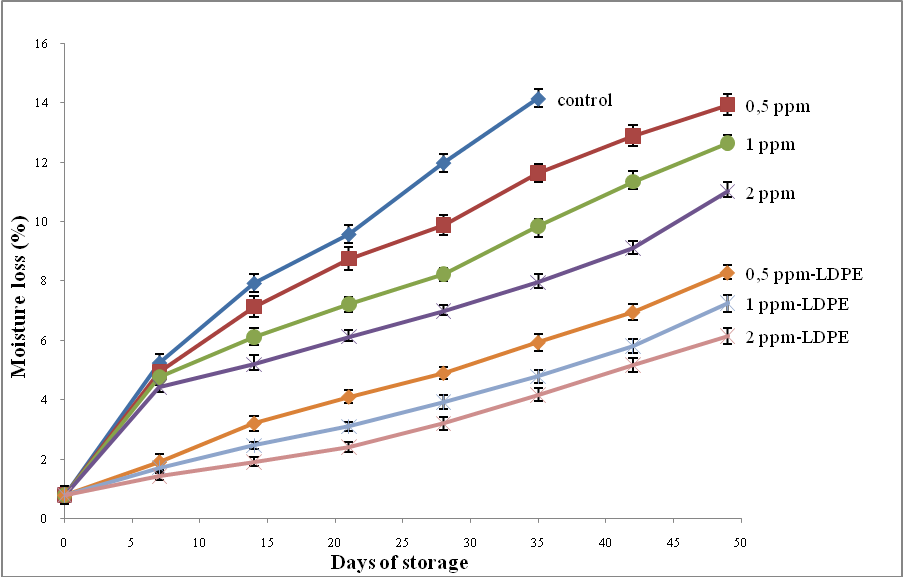
*R2pred= (1 – PESS) / (SStotal − SSblock)* (Eq.3)

where *n* is the number of experiments, *p* is the number of model parameters including intercept and any block coefficient, and PESS is the prediction error of sum of squares:

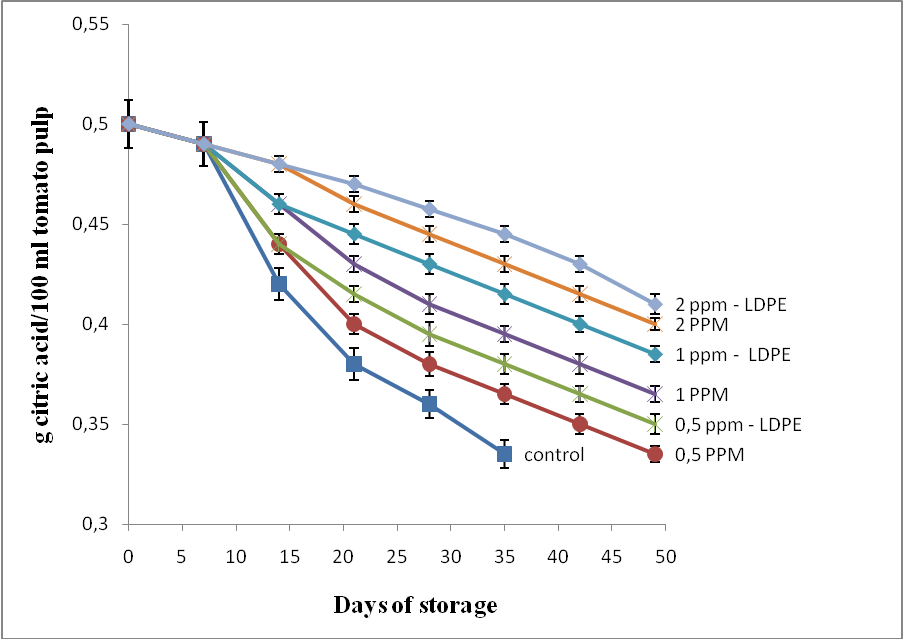
PESS= , e i, -i = yi- ȳ i, -i  (Eq.4)

where *ei*,−*i* is residual, *yi* is the experimental value, and ȳi,−1 is the predicted value.

**Supplementary Figures**



**Supplementary Fig.1.** Effect of ozonation, packaging and storage time on moisture loss (%) in tomatoes stored at 4±1 °C



**Supplementary Fig. 2**. Effect of ozonation, packaging and storage time on acidity of tomato pulp stored at 4±1 °C