

SUPPLEMENTARY MATERIAL

Local agro-environmental conditions impact fruit quality, sensory properties and consumer acceptance of long shelf-life tomatoes

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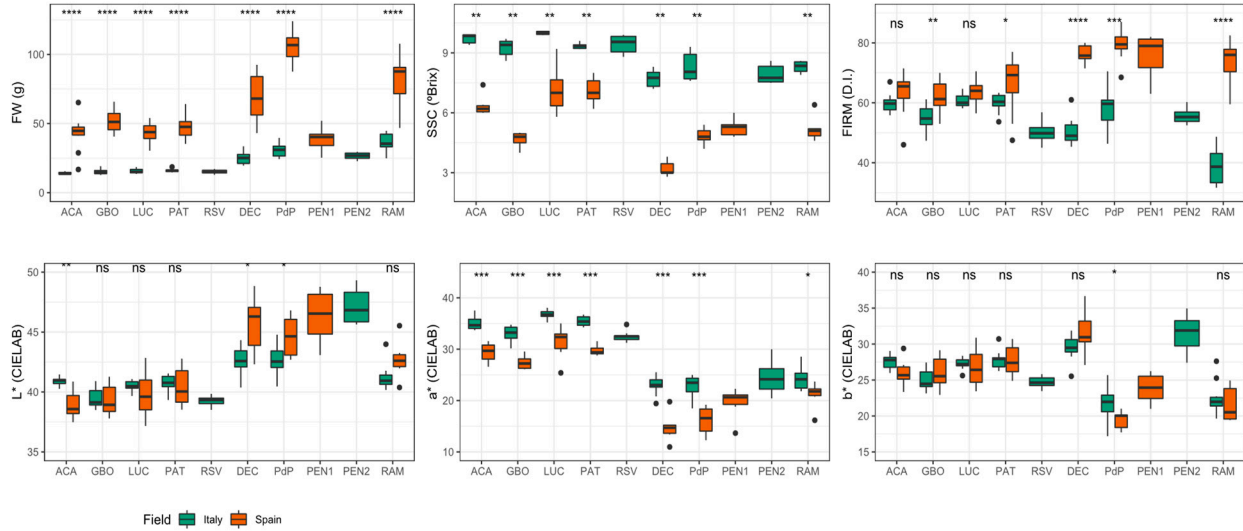


Figure S1. Effect of the agro-environmental conditions (Italy, low-input, no irrigation; Spain, high-input, full-irrigation) on fruit quality traits at harvest (T0) of each variety belonging to the 'Piennolo' (ACA, GBO, LUC, PAT, RSV) and 'Penjar-Ramellet' (DEC, PdP, PEN1, PEN2, RAM) groups. Fruit weight (FW); fruit soluble solids content (SSC); fruit firmness (FIRM); fruit external color (CIELAB coordinates L*, a* and b*). Comparisons between cultivation sites are presented for each variety (Mann-Whitney-Wilcoxon pairwise test). Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$; ns, not significant.

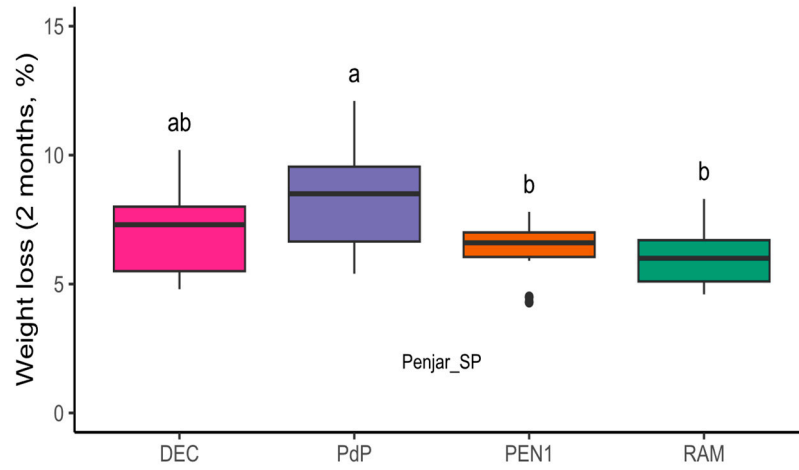


Figure S2. Fruit weight (FW) loss during the first 2 months of postharvest in the 'Penjar-Ramellet' varieties grown in Spain. Variety codes are listed in Table 1. Different letters indicate significant differences at $p < 0.05$ (Tukey's HSD test).

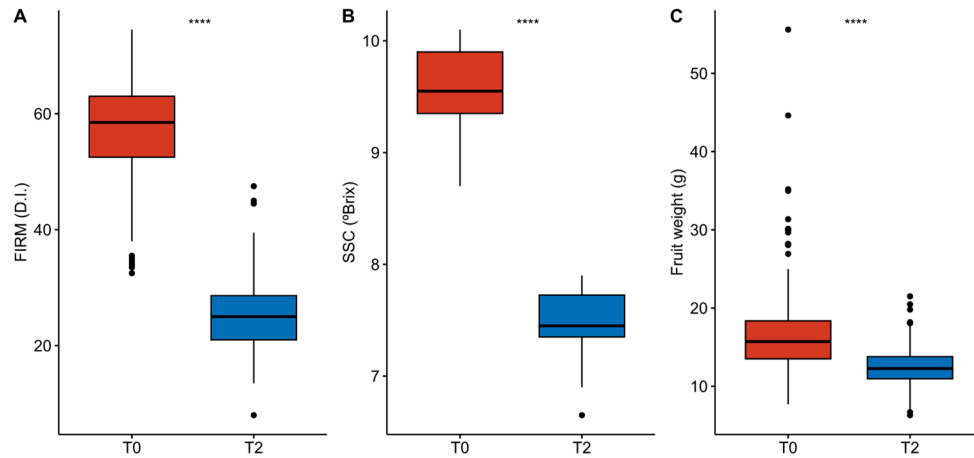


Figure S3. Evolution of (A) fruit firmness (FIRM), (B) fruit soluble solids content (SSC), and (C) fruit weight (FW) from harvest (T0) to the time sensory analyses were conducted in Italy (T2= 4.5 months after harvest) on the 'Piennolo' varieties grown in Italy. Comparisons between T0 and T2 were assessed using the Mann-Whitney-Wilcoxon (MWW) pairwise test. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$; ns, not significant.

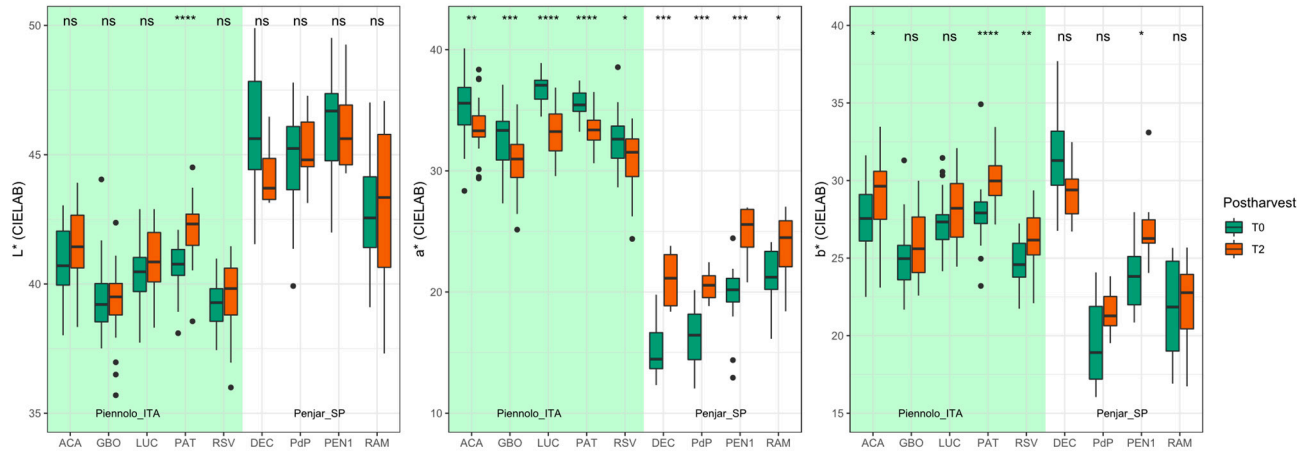


Figure S4. Evolution of fruit external color (CIELAB space coordinates L^* , a^* and b^*) during postharvest for each variety belonging to the ‘Piennolo’ (ACA, GBO, LUC, PAT, RSV) and ‘Penjar-Ramellet’ (DEC, PdP, PEN1, PEN2, RAM) groups grown in Italy (Piennolo_ITA) and Spain (Penjar_SP), respectively. T0= harvest, T2= 4.5 months and 3 months postharvest in Italy and Spain, respectively. Comparisons between T0 and T2 are presented for each variety (Mann-Whitney-Wilcoxon pairwise test). Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$; ns, not significant.

Table S1. Analysis of variance and means of sensory descriptors of the Italian ‘Piennolo’ varieties (raw and baked products) evaluated in Italy at T2 (4.5 months after harvest). Scale from 0 to 9, continuous (for endpoint labels see Tables 2 and 3). Values are averages of three replicates.

| RAW TOMATO | | | | | | | | | BAKED TOMATO | | | |
|-------------------|---|-----------------|--------------|---------------|-------------------|--------------|--------------|---------------|--------------|---------------|-----------------------|----------------------------|
| Variety | | Color intensity | Shriveling | Seeds | Resistance to cut | Overall odor | Green odor | Ripe odor | Skin – Sweet | Skin – Bitter | Skin – Overall flavor | Skin – Baked tomato flavor |
| ACA | | 5.9 (1.26) b | 4.4(1.98) b | 5.5 (0.68) bc | 6.5 (1.25) a | 7.2 (1.14) | 6.6 (0.77) a | 3.6 (1.02) ab | 3.4 (0.91) | 3.4 (0.92) | 7.1 (0.79) | 5.8 (0.91) |
| RSV | | 7.2 (1.72) a | 5.1 (2.06) b | 6.6 (0.84) a | 5.5 (1.12) b | 6.8 (0.59) | 5.9 (0.95) b | 4.2 (0.92) a | 3.4 (1.06) | 3.3 (0.83) | 7.2 (0.58) | 6.0 (0.97) |
| LUC | | 4.5 (1.90) c | 4.4 (2.12) b | 5.2 (0.74) c | 5.9 (1.51) ab | 7.3 (1.51) | 6.8 (0.64) a | 3.3 (1.38) b | 3.2 (0.96) | 3.6 (0.97) | 7.2 (0.51) | 6.2 (0.70) |
| PAT | | 5.2 (2.19) bc | 4.6 (2.22) b | 5.9 (0.70) ab | 6.7 (1.21) a | 7.3 (0.70) | 6.8 (0.83) a | 3.1 (0.83) b | 3.1 (1.07) | 3.5 (0.85) | 7.3 (0.66) | 6.1 (0.87) |
| GBO | | 7.3 (1.33) a | 6.9 (1.08) a | 6.6 (0.58) a | 5.5 (1.52) b | 7.3 (0.67) | 6.5 (0.90) a | 3.8 (0.94) ab | 2.9 (0.94) | 3.9 (1.06) | 7.2 (0.66) | 6.0 (0.83) |
| Variety | F | 15.816 | 9.108 | 7.724 | 4.128 | 1.959 | 4.519 | 3.545 | 0.949 | 1.301 | 0.460 | 0.351 |
| | p | <0.0001 | <0.0001 | <0.0001 | 0.004 | ns | 0.002 | 0.010 | ns | ns | ns | ns |
| Replicate | F | 0.883 | 9.220 | 1.750 | 2.735 | 0.559 | 1.179 | 5.883 | 3.157 | 7.397 | 0.335 | 1.345 |
| | p | ns | <0.0001 | ns | ns | ns | ns | 0.004 | 0.047 | 0.001 | ns | ns |
| Variety*Replicate | F | 6.968 | 2.417 | 0.895 | 2.131 | 0.573 | 1.806 | 1.576 | 1.449 | 0.507 | 0.903 | 1.040 |
| | p | <0.0001 | 0.020 | ns | 0.041 | ns | ns | ns | ns | ns | ns | ns |

| BAKED TOMATO | | | | | | | | | | | |
|-------------------|---|-----------------|---------------------------|--------------|-------------------|-------------|-------------|------------|--------------|----------------|---------------------|
| Variety | | Skin – Hardness | Skin – Bitter persistence | Overall odor | Baked tomato odor | Sweet taste | Salty taste | Acid taste | Bitter taste | Overall flavor | Baked tomato flavor |
| ACA | | 7.1 (1.03) | 2.5 (0.98) b | 6.7 (0.56) | 5.8 (0.80) | 3.1 (0.81) | 3.7 (0.76) | 2.9 (0.82) | 3.1 (0.96) | 6.8 (0.67) | 5.7 (0.97) |
| RSV | | 7.2 (0.96) | 2.2 (1.06) b | 6.7 (0.61) | 5.7 (0.68) | 3.4 (0.81) | 3.4 (0.88) | 2.7 (0.89) | 3.1 (0.93) | 6.8 (0.50) | 5.6 (0.80) |
| LUC | | 7.5 (0.94) | 2.7 (0.95) b | 6.7 (0.57) | 5.9 (0.74) | 3.3 (0.90) | 3.6 (0.76) | 3.0 (0.99) | 3.1 (0.93) | 7.0 (0.46) | 6.1 (0.82) |
| PAT | | 7.1 (1.02) | 2.5 (0.93) b | 6.7 (0.50) | 5.7 (0.85) | 3.3 (0.76) | 3.7 (0.91) | 3.1 (0.85) | 2.8 (0.97) | 6.9 (0.59) | 5.7 (0.92) |
| GBO | | 7.6 (0.89) | 3.4 (1.00) a | 6.9 (0.53) | 6.0 (0.89) | 3.0 (0.96) | 3.6 (0.93) | 2.9 (0.87) | 3.2 (0.99) | 7.1 (0.49) | 5.8 (0.80) |
| Variety | F | 0.954 | 5.158 | 0.290 | 0.385 | 0.950 | 0.589 | 0.276 | 0.722 | 0.837 | 0.792 |
| | p | ns | 0.001 | ns | ns | ns | ns | ns | ns | ns | ns |
| Replicate | F | 1.624 | 9.905 | 0.104 | 1.732 | 1.385 | 0.024 | 0.413 | 8.399 | 0.152 | 1.076 |
| | p | ns | 0.0001 | ns | ns | ns | ns | ns | 0.0001 | ns | ns |
| Variety*Replicate | F | 2.137 | 1.262 | 1.296 | 0.746 | 1.130 | 0.846 | 0.509 | 0.288 | 0.200 | 0.695 |
| | p | 0.040 | ns | ns | ns | ns | ns | ns | ns | ns | ns |

Means in a column with different letters are statistically different (multiple pairwise comparisons using Tukey’s test at $p < 0.05$).

Table S2. Frequency (%) of the olfactory and flavor notes checked on raw and baked tomato products of the ‘Piennolo’ varieties evaluated in Italy at T2 (4.5 months after harvest).

| | Perceived olfactory and flavor notes | ACA | RSV | LUC | PAT | GBO | K ⁽¹⁾ | p-value |
|--------------|--------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|--------------|
| RAW TOMATO | Pea, legume odor | 15.0 | 5.0 | 13.6 | 22.7 | 9.1 | 3.268 | 0.514 |
| | Herbaceous odor | 85.0 | 75.0 | 81.8 | 77.3 | 72.7 | 1.221 | 0.875 |
| | Stem (stalk, tomato leaf) odor | 60.0 | 40.0 | 59.1 | 63.6 | 68.2 | 3.892 | 0.421 |
| | Floral odor | 15.0 | 5.0 | 4.5 | 9.1 | 9.1 | 1.848 | 0.764 |
| | Fruity odor | 5.0 | 0.0 | 0.0 | 4.5 | 0.0 | 3.089 | 0.543 |
| | Baked tomato odor | 20.0 | 40.0 | 22.7 | 18.2 | 45.5 | 6.429 | 0.169 |
| | Undergrowth odor | 0.0 | 5.0 | 4.5 | 13.6 | 9.1 | 3.599 | 0.463 |
| | Diacetyl-like odor | 10.0 | 5.0 | 13.6 | 18.2 | 31.8 | 6.527 | 0.163 |
| BAKED TOMATO | Pea, legume flavor | 5.0 | 10.0 | 4.5 | 9.1 | 9.1 | 0.785 | 0.940 |
| | Green, unripe flavor | 25.0 ^b | 25.0 ^b | 31.8 ^b | 68.2 ^a | 22.7 ^b | 13.845 | 0.008 |
| | Skin - astringency | 30.0 | 5.0 | 9.1 | 13.6 | 4.5 | 8.212 | 0.084 |
| | Skin - metallic | 5.0 | 0.0 | 4.5 | 4.5 | 9.1 | 1.915 | 0.751 |

⁽¹⁾ Kruskal-Wallis values.

Means in a row with different letters are statistically different (multiple pairwise comparisons using Dunn's procedure at $p < 0.05$, two-tailed test).

Table S3. Analysis of variance and means of physicochemical parameters of the Italian ‘Piennolo’ varieties (raw and baked products) evaluated in Italy at T2 (4.5 months after harvest). Values are averages of three replicates.

| Variety | | FW (g) | L* | a* | b* | a*/b* | Hue angle (h°) | Chroma (C*) | FIRM D.I. | SHR | pH | TA (g CA/100g) | SSC (°Bx) | SSC/TA | TI |
|-------------------|---|--------|----------|----------|----------|---------|----------------|-------------|-----------|--------|---------|----------------|-----------|---------|---------|
| ACA | | 11.82 | 41.524 a | 33.487 a | 29.104 b | 1.154 b | 37.03 b | 44.38 a | 28.5 a | 2.2 bc | 4.56 bc | 0.470 b | 7.6 b | 16.25 a | 1.30 a |
| RSV | | 12.44 | 39.794 c | 31.490 b | 26.502 c | 1.189 a | 35.41 c | 41.17 b | 23.9 bc | 2.3 b | 4.55 c | 0.461 b | 7.5 b | 16.42 a | 1.28 a |
| LUC | | 12.45 | 40.750 b | 33.697 a | 28.316 b | 1.193 a | 35.27 c | 44.04 a | 25.9 ab | 1.8 c | 4.55 c | 0.472 b | 7.8 a | 16.49 a | 1.30 a |
| PAT | | 13.13 | 42.097 a | 33.613 a | 30.162 a | 1.117 c | 38.82 a | 45.18 a | 27.2 a | 1.9 c | 4.57 b | 0.507 a | 7.4 c | 14.74 b | 1.24 b |
| GBO | | 12.07 | 39.563 c | 31.305 b | 26.265 c | 1.192 a | 35.19 c | 40.87 b | 21.1 c | 3.0 a | 4.62 a | 0.473 b | 7.0 d | 14.55 b | 1.21 c |
| Variety | F | 1.432 | 21.607 | 11.062 | 24.000 | 10.533 | 10.811 | 18.336 | 8.563 | 8.372 | 22.089 | 10.933 | 122.493 | 19.458 | 46.804 |
| | p | ns | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Replicate | F | 1.247 | 1.024 | 2.356 | 1.559 | 0.043 | 0.050 | 2.329 | 2.343 | 0.946 | 43.457 | 36.368 | 13.255 | 27.534 | 27.321 |
| | p | ns | ns | ns | ns | ns | ns | ns | ns | ns | <0.0001 | <0.0001 | 0.001 | <0.0001 | <0.0001 |
| Variety*Replicate | F | 1.304 | 1.512 | 1.235 | 1.375 | 1.392 | 1.320 | 1.298 | 0.630 | 1.295 | 18.132 | 18.526 | 28.725 | 13.940 | 18.708 |
| | p | ns | ns | ns | ns | ns | ns | ns | ns | ns | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |

Means in a column with different letters are statistically different (multiple pairwise comparisons using Tukey’s test at $p<0.05$). FW = fruit weight; FIRM = firmness (Durofel); SHR = shriveling; TA = titratable acidity; SSC = soluble solids content; TI = taste index

Table S4. Analysis of variance and means of consumers' liking judgments for raw and baked tomato products of the 'Piennolo' varieties evaluated in Italy at T2 (4.5 months after harvest). 9-point hedonic scale.

| Variety | Aspect liking (on raw) | Odor liking (on raw) | Flavor liking (on baked) | Overall liking (on raw and baked) |
|----------|---------------------------|-------------------------|-----------------------------|--------------------------------------|
| ACA | 6.1 (1.84) ^a | 5.9 (1.85) | 5.6 (2.02) | 5.7 (1.93) |
| RSV | 5.7 (2.09) ^{ab} | 5.7 (1.92) | 5.3 (2.29) | 5.4 (2.28) |
| LUC | 5.8 (2.04) ^{ab} | 5.9 (1.81) | 5.6 (2.19) | 5.5 (2.23) |
| PAT | 5.9 (1.85) ^a | 6.0 (1.77) | 5.1 (2.13) | 5.2 (2.06) |
| GBO | 5.4 (2.02) ^b | 5.5 (1.90) | 5.4 (2.21) | 5.5 (2.22) |
| F | 2.561 | 1.216 | 1.200 | 1.208 |
| <i>p</i> | 0.010 | ns | ns | ns |

Means in a column with different letters are statistically different; Fisher's (LSD) test ($p < 0.05$).

Table S5. Effects of socio-demographic categories on tomato liking for the Italian consumers.

| | % | Aspect liking | Odor liking | Flavor liking | Overall liking |
|-------------------------------------|----------|-------------------|-------------------|-------------------|-------------------|
| GENDER | | | | | |
| Male | 50.5 | 6.0 ^a | 5.9 | 5.6 ^a | 5.7 ^a |
| Female | 49.5 | 5.5 ^b | 5.7 | 5.2 ^b | 5.3 ^b |
| | <i>p</i> | 0.005 | <i>ns</i> | 0.028 | 0.031 |
| AGE | | | | | |
| 18 – 24 y | 15.5 | 5.7 | 6.0 | 4.9 ^b | 5.2 |
| 25 – 34 y | 16.5 | 5.9 | 5.7 | 5.1 ^b | 5.1 |
| 35 – 49 y | 34 | 5.7 | 5.7 | 5.4 ^{ab} | 5.5 |
| 50 – 65 y | 35 | 5.8 | 5.9 | 5.8 ^a | 5.7 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | 0.014 | <i>ns</i> |
| SOCIO-PROFESSIONAL | | | | | |
| Farmer, Craftsman, Worker | - | - | - | - | - |
| Employee | 43.7 | 5.8 ^b | 5.7 ^b | 5.4 ^b | 5.5 ^{bc} |
| Intermediate occupation | 2.9 | 5.7 ^b | 5.5 ^b | 5.9 ^b | 5.9 ^{bc} |
| Manager, High-level professionals | 11.6 | 6.0 ^b | 6.1 ^b | 5.8 ^b | 5.8 ^{bc} |
| Unemployed | 2.9 | 6.0 ^b | 6.3 ^{ab} | 6.5 ^{ab} | 6.5 ^{ab} |
| Student | 17.5 | 5.5 ^b | 5.7 ^b | 4.6 ^c | 4.8 ^c |
| Retired | 2.9 | 7.5 ^a | 7.5 ^a | 7.5 ^a | 7.5 ^a |
| Stay-at-home | 18.4 | 5.6 ^b | 5.6 ^b | 5.3 ^b | 5.2 ^c |
| | <i>p</i> | 0.018 | 0.008 | <0.0001 | <0.0001 |
| EDUCATION | | | | | |
| Lower secondary school (until 14 y) | 3.9 | 5.8 ^{ab} | 5.7 | 5.6 ^{ab} | 5.6 ^{ab} |
| Upper secondary school (until 18 y) | 78.6 | 5.7 ^b | 5.7 | 5.3 ^b | 5.3 ^b |
| High school / University beyond | 17.5 | 6.4 ^a | 6.1 | 5.9 ^a | 5.9 ^a |
| | <i>p</i> | 0.011 | <i>ns</i> | 0.047 | 0.049 |
| SHOPPING | | | | | |
| Shop alone | 39.8 | 5.8 | 5.8 | 5.5 | 5.5 |
| Occasionally with others | 8.7 | 6.1 | 5.9 | 5.6 | 5.7 |
| Share with others | 51.5 | 5.8 | 5.8 | 5.3 | 5.4 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| CONSUMPTION FREQUENCY | | | | | |
| Once a day | - | - | - | - | - |
| 4-5 times/week | 5.8 | 7.1 ^a | 6.8 ^a | 5.5 | 5.7 ^{ab} |
| 2-3 times/week | 20.4 | 5.9 ^b | 6.0 ^{bc} | 5.7 | 5.9 ^a |
| Once a week | 28.1 | 5.7 ^b | 5.8 ^{cd} | 5.3 | 5.3 ^{ab} |
| Every 15 days | 34.0 | 5.3 ^c | 5.4 ^d | 5.1 | 5.1 ^b |
| Once a month | 11.6 | 6.6 ^a | 6.4 ^{ab} | 5.8 | 5.9 ^a |
| | <i>p</i> | <0.0001 | <0.0001 | <i>ns</i> | 0.016 |

Means in a column with different letters are statistically different; Fisher's (LSD) test ($p < 0.05$).

Table S6. Analysis of variance and means of sensory descriptors of the Spanish ‘Penjar-Ramellet’ varieties (raw and spread on bread) evaluated in Spain at T2 (3 months after harvest). Scale from 0 to 10, continuous (for endpoint labels see Tables 2 and 4). Values are averages of two replicates.

| RAW TOMATO | | | | | | | | | | | |
|------------------------|----------|---------------------------|--------------------------|--------------------------|-------------------------|--------------------------|-------------|------------|-------------|--------------------------|-------------------------|
| Variety | | Color intensity | Shriveling | Seeds | Resistance to cut | Overall odor | Green odor | Ripe odor | Sweet taste | Acid taste | Off-Flavor |
| 545 | | 6.6 (1.19) ^{ab} | 6.0 (2.47) ^{ab} | 6.6 (1.70) | 5.3 (1.58) | 4.8 (1.71) ^{ab} | 3.1 (2.21) | 3.4 (2.60) | 2.2 (2.08) | 2.0 (1.44) ^b | 7.0 (2.85) ^a |
| PdP | | 5.6 (1.03) ^b | 6.9 (1.03) ^a | 6.2 (1.59) | 5.8 (1.42) | 5.1 (2.03) ^{ab} | 2.6 (2.57) | 3.7 (2.06) | 2.8 (1.85) | 4.4 (2.30) ^a | 2.1 (2.43) ^b |
| RAM | | 7.5 (1.05) ^a | 4.8 (1.97) ^b | 6.7 (1.24) | 3.7 (1.49) | 3.8 (1.72) ^b | 1.6 (1.74) | 3.3 (1.92) | 2.6 (1.73) | 4.8 (1.98) ^a | 2.0 (2.75) ^b |
| PEN1 | | 2.9 (1.35) ^c | 1.1 (0.78) ^c | 5.0 (2.19) | 5.4 (1.96) | 5.9 (1.49) ^a | 3.8 (2.94) | 4.8 (2.14) | 3.7 (1.97) | 5.2 (1.76) ^a | 1.3 (1.87) ^b |
| DEC | | 6.5 (1.23) ^{ab} | 2.0 (1.09) ^c | 5.0 (2.25) | 5.5 (1.82) | 4.6 (1.79) ^{ab} | 3.3 (2.29) | 3.0 (2.18) | 2.3 (1.26) | 3.7 (2.20) ^{ab} | 2.5 (1.82) ^b |
| Variety | F | 32.047 | 46.813 | 3.018 | 3.156 | 2.509 | 1.513 | 1.329 | 1.522 | 5.241 | 12.436 |
| | <i>p</i> | <0.0001 | <0.0001 | <i>ns</i> | <i>ns</i> | 0.051 | <i>ns</i> | <i>ns</i> | <i>ns</i> | 0.001 | <0.0001 |
| Session | F | 0.869 | 2.657 | 0.004 | 1.874 | 1.678 | 0.534 | 0.223 | 0.243 | 0.552 | 0.005 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| Variety*session | F | 1.280 | 6.129 | 1.396 | 0.331 | 0.076 | 0.427 | 0.330 | 0.876 | 0.095 | 0.478 |
| | <i>p</i> | <i>ns</i> | <0.0001 | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| TOMATO SPREAD ON BREAD | | | | | | | | | | | |
| Variety | | Spreadability | Overall odor | Seeds | Color intensity | Overall flavor | Sweet taste | Acid taste | | | |
| 545 | | 8.2 (0.88) ^a | 3.0 (2.12) | 6.6 (1.90) ^a | 8.5 (0.81) ^a | 5.6 (2.50) | 3.7 (2.88) | 3.1 (2.19) | | | |
| PdP | | 5.8 (1.88) ^c | 2.0 (2.42) | 6.0 (1.84) ^a | 5.3 (2.52) ^b | 4.2 (1.97) | 2.8 (2.11) | 3.7 (1.87) | | | |
| RAM | | 8.1 (1.01) ^{ab} | 1.8 (1.41) | 5.1 (2.29) ^{ab} | 7.1 (1.39) ^a | 4.7 (2.03) | 3.2 (1.80) | 4.0 (1.72) | | | |
| PEN1 | | 6.5 (1.33) ^{abc} | 3.7 (1.89) | 2.3 (1.85) ^c | 2.4 (1.39) ^c | 4.0 (1.76) | 3.6 (2.08) | 3.2 (1.83) | | | |
| DEC | | 6.9 (2.07) ^{bc} | 1.9 (1.83) | 3.1 (2.16) ^{bc} | 4.3 (1.78) ^b | 2.9 (2.01) | 2.0 (2.01) | 2.6 (1.99) | | | |
| Variety | F | 6.883 | 2.415 | 12.620 | 29.994 | 3.059 | 1.415 | 1.047 | | | |
| | <i>p</i> | <0.0001 | <i>ns</i> | <0.0001 | <0.0001 | <i>ns</i> | <i>ns</i> | <i>ns</i> | | | |
| Session | F | 0.013 | 0.120 | 0.702 | 0.000 | 0.377 | 0.146 | 0.168 | | | |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | | | |
| Variety*session | F | 2.232 | 0.544 | 2.343 | 2.471 | 0.121 | 0.154 | 0.790 | | | |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | | | |

Means in a column with different letters are statistically different (multiple pairwise comparisons using Tukey’s test at $p < 0.05$).

Table S7. Frequency (%) of the olfactory notes checked on raw products of the ‘Penjar-Ramellet’ varieties evaluated in Spain at T2 (3 months after harvest).

| | Perceived olfactory notes | 545 | PdP | RAM | PEN1 | DEC | K ⁽¹⁾ | p-value |
|------------|---------------------------|------|------|------|------|------|------------------|---------|
| RAW TOMATO | Pea, legume odor | 14.3 | 7.1 | 0.0 | 14.3 | 7.1 | 2.516 | 0.642 |
| | Herbaceous odor | 21.4 | 14.3 | 14.3 | 28.6 | 14.3 | 1.490 | 0.828 |
| | Stem odor | 14.3 | 35.7 | 35.7 | 14.3 | 35.7 | 3.845 | 0.427 |
| | Floral odor | 14.3 | 21.4 | 7.1 | 42.9 | 21.4 | 5.855 | 0.210 |
| | Fruity odor | 57.1 | 50.0 | 42.9 | 50.0 | 42.9 | 0.789 | 0.940 |
| | Baked tomato odor | 0.0 | 14.3 | 0.0 | 0.0 | 0.0 | 8.118 | 0.087 |
| | Undergrowth odor | 28.6 | 28.6 | 35.7 | 21.4 | 14.3 | 1.917 | 0.751 |
| | Diacetyl-like odor | 7.1 | 0.0 | 0.0 | 0.0 | 14.3 | 5.493 | 0.240 |

⁽¹⁾ Kruskal-Wallis values.

Means in a row with different letters are statistically different (multiple pairwise comparisons using Dunn's procedure at $p < 0.05$, two-tailed test).

Table S8. Analysis of variance and means of consumers' liking judgments for tomato products (raw and spread on bread) of the Spanish 'Penjar-Ramellet' varieties evaluated in Spain at T2 (3 months after harvest). 9-point hedonic scale.

| Variety | Aspect liking (on raw) | Odor liking (on raw) | Overall liking- spreadability (on bread) | Overall liking (on bread) |
|----------|---------------------------|--------------------------|--|------------------------------|
| DEC | 6.6 (1.51) ^{ab} | 5.7 (1.40) ^{ab} | 6.6 (1.49) ^a | 5.6 (1.87) ^a |
| PdP | 5.9 (1.70) ^c | 6.1 (1.63) ^a | 6.1 (1.59) ^a | 5.9 (1.72) ^a |
| RAM | 6.0 (1.69) ^{bc} | 5.7 (1.85) ^{ab} | 6.4 (1.66) ^a | 5.5 (1.84) ^a |
| 545 | 6.7 (1.56) ^a | 5.2 (1.75) ^b | 6.5 (1.68) ^a | 4.6 (2.23) ^b |
| PEN1 | 5.4 (1.86) ^d | 5.5 (1.83) ^b | 5.6 (1.88) ^b | 5.8 (2.04) ^a |
| F | 8.371 | 3.171 | 4.707 | 5.933 |
| <i>p</i> | <0.0001 | 0.014 | 0.001 | <0.0001 |

Means in a column with different letters are statistically different; Fisher's (LSD) ($p < 0.05$).

Table S9. Effects of socio-demographic categories on tomato liking for the Spanish consumers.

| | % | Aspect liking | Odor liking | Overall liking-spreadability | Overall liking (bread with tomato) |
|---|----------|-------------------|-------------------|------------------------------|------------------------------------|
| GENDER | | | | | |
| Male | 41.6 | 6.6 ^a | 6.0 ^a | 6.5 ^a | 5.9 ^a |
| Female | 57.0 | 6.1 ^b | 5.4 ^b | 6.1 ^b | 5.3 ^b |
| Not declared | 1.4 | 4.7 ^c | 3.3 ^c | 3.8 ^c | 2.1 ^c |
| | <i>p</i> | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| AGE | | | | | |
| 18 – 24 y | 44.1 | 6.0 | 5.8 | 6.4 | 5.6 |
| 25 – 34 y | 13.6 | 6.3 | 5.8 | 6.2 | 5.7 |
| 35 – 49 y | 17.7 | 6.1 | 5.3 | 6.2 | 5.4 |
| 50 – 65 y | 19.1 | 6.1 | 5.5 | 6.3 | 5.3 |
| >65 y | 5.5 | 5.9 | 5.1 | 5.3 | 5.0 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| SOCIO-PROFESSIONAL | | | | | |
| Farmer, Craftsman, Worker | 9.9 | 6.1 | 5.9 | 6.2 ^a | 5.7 |
| Employee | 27.1 | 6.3 | 5.5 | 6.5 ^a | 5.6 |
| Intermediate occupation | 6.7 | 6.0 | 5.9 | 5.9 ^{ab} | 5.6 |
| Manager, High-level professionals | 5.1 | 5.3 | 5.2 | 6.1 ^{ab} | 4.7 |
| Student | 46.0 | 6.0 | 5.7 | 6.3 ^a | 5.5 |
| Retired | 5.3 | 5.9 | 5.0 | 5.2 ^b | 5.0 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | < 0.02 | <i>ns</i> |
| EDUCATION | | | | | |
| Lower secondary school or unfinished (until 14 y) | 3.0 | 5.9 | 5.8 | 6.6 | 5.8 |
| Upper secondary school (until 18 y) | 40.5 | 6.0 | 5.7 | 6.3 | 5.5 |
| High school / University beyond (>18 y) | 56.5 | 6.2 | 5.6 | 6.2 | 5.5 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| CONSUMPTION FREQUENCY (in autumn-winter) | | | | | |
| Once a day | - | - | - | - | - |
| 4-5 times/week | 44.4 | 6.1 | 5.6 | 6.3 | 5.5 |
| 2-3 times/week | 28.3 | 6.1 | 5.5 | 6.1 | 5.4 |
| Once a week | - | - | - | - | - |
| Every 15 days | 14.9 | 6.1 | 6.0 | 6.2 | 5.5 |
| Once a month | 3.9 | 5.7 | 5.8 | 6.5 | 6.0 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |
| CONSUMPTION FREQUENCY (in spring-summer) | | | | | |
| Once a day | - | - | - | - | - |
| 4-5 times/week | 37.7 | 6.0 | 5.8 | 6.3 | 5.6 |
| 2-3 times/week | 34.2 | 6.2 | 5.5 | 6.1 | 5.3 |
| Once a week | - | - | - | - | - |
| Every 15 days | 14.7 | 5.8 | 5.5 | 6.1 | 5.5 |
| Once a month | 7.1 | 6.4 | 5.9 | 6.7 | 5.6 |
| | <i>p</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> | <i>ns</i> |

Means in a column with different letters are statistically different; Fisher's (LSD) ($p < 0.05$).