

Table S1. Effects of heat-treatment of the film-forming solution, the addition of tarragon essential oil, and their first-degree interaction on thickness, moisture content, swelling degree, solubility in water, and WVP of edible films.

Factor	Thickness (mm)	Moisture Content (%)	Swelling Degree (%)	Solubility in Water (%)	WVP (g mm/m ² day kPa)
Heat-treatment					
UNT	0.43 ^b	45.8 ^b	100.5 ^b	97.5 ^a	7.6 ^b
HT	0.46 ^a	52.9 ^a	101.4 ^a	96.7 ^b	8.5 ^a
<i>p</i> /CTR (%)	0.000 ^{***} /21.8	0.000 ^{***} /45.2	0.000 ^{***} /68.1	0.000 ^{***} /14.5	0.003 ^{**} /19.9
Addition of tarragon essential oil					
C	0.45 ^a	46.2 ^c	100.8 ^{ab}	95.3 ^a	7.5 ^a
F0.5	0.45 ^a	46.3 ^c	101.1 ^a	96.8 ^c	7.4 ^a
F1	0.44 ^a	48.8 ^{bc}	101.1 ^a	97.1 ^{bc}	8.0 ^a
F1.5	0.45 ^a	50.6 ^{ab}	100.6 ^b	97.3 ^b	8.2 ^a
F2	0.44 ^a	51.4 ^{ab}	101.0 ^{ab}	97.9 ^a	8.7 ^a
F2.5	0.44 ^a	53.0 ^a	100.9 ^{ab}	98.0 ^a	8.5 ^a
<i>p</i> /CTR (%)	0.606 ^{NS} /1.0	0.000 ^{***} /23.7	0.005 ^{**} /9.2	0.000 ^{***} /68.7	0.026 [*] /27.8
Heat-treatment x Addition of tarragon essential oil					
UNT x C	0.44±0.02 ^{abc}	44.2±1.81 ^{ef}	100.5±0.07 ^{ef}	95.6±0.18 ^e	7.7±0.14 ^{abc}
UNT x F0.5	0.44±0.01 ^{bc}	40.4±7.12 ^f	100.4±0.01 ^f	96.7±0.15 ^d	6.7±0.50 ^c
UNT x F1	0.43±0.02 ^c	44.1±2.24 ^{ef}	100.4±0.04 ^f	97.1±0.09 ^{cd}	6.9±0.07 ^c
UNT x F1.5	0.43±0.02 ^c	49.4±1.12 ^{bcd}	100.4±0.09 ^f	97.9±0.12 ^{bc}	8.3±0.35 ^{abc}
HT x F2	0.43±0.01 ^c	46.4±2.75 ^{def}	100.4±0.11 ^f	98.9±0.12 ^a	7.8±0.14 ^{abc}
UNT x F2.5	0.43±0.02 ^c	50.6±2.06 ^{abcde}	100.6±0.04 ^{def}	98.6±0.21 ^{ab}	8.7±0.07 ^{abc}
HT x C	0.45±0.03 ^{ab}	48.1±0.62 ^{cde}	101.1±0.03 ^{cde}	95.0±0.37 ^e	7.3±0.50 ^{bc}
HT x F0.5	0.45±0.02 ^{ab}	52.1±1.89 ^{abcd}	101.7±0.08 ^{ab}	96.8±0.17 ^d	8.2±1.20 ^{abc}
HT x F1	0.46±0.02 ^{ab}	53.5±2.03 ^{abc}	101.9±0.23 ^a	97.1±0.07 ^{cd}	9.3±0.64 ^{ab}
HT x F1.5	0.46±0.03 ^a	51.8±0.80 ^{abcd}	100.9±0.17 ^{def}	96.8±0.50 ^d	8.2±0.71 ^{abc}
HT x F2	0.46±0.02 ^{ab}	56.4±1.12 ^a	101.6±0.61 ^{abc}	96.8±0.47 ^d	9.6±0.71 ^a
HT x F2.5	0.46±0.02 ^{ab}	55.5±2.78 ^{ab}	101.2±0.29 ^{bcd}	97.4±0.42 ^{cd}	8.5±0.35 ^{abc}
<i>p</i> /CTR (%)	0.044 [*] /3.1	0.007 ^{**} /10.9	0.001 ^{**} /12.8	0.000 ^{***} /12.3	0.012 [*] /35.0

UNT-untreated films; HT-heat-treated films; C-control film; F0.5-film with 0.5% tarragon essential oil; F1-film with 1% tarragon essential oil; F1.5-film with 1.5% tarragon essential oil; F2-film with 2% tarragon essential oil; F2.5-film with 2.5% tarragon essential oil; WVP-water vapor permeability; *p*-probability; CTR (%) -percentage contribution. Values are expressed as mean ± standard deviation of twenty-four replicates for thickness, four for moisture content, respectively three replicates for swelling degree, solubility in water, and WVP. Different letters in the same column indicate statistically significant differences at *p* < 0.05 (Tukey's test). Significance: *p* ≥ 0.05^{NS}, not significant; *p* < 0.05^{*}, significant; *p* < 0.01^{**}, very significant; *p* < 0.001^{***}, extremely significant.

Table S2. Effects of heat-treatment of the film-forming solution, the addition of tarragon essential oil, and their first-degree interaction on color parameters and transparency of edible films.

Factor	Color Parameters				Transparency (A600/mm)
	L^*	a^*	b^*	ΔE^*	
Heat-treatment					
UNT	81.27 ^a	2.80 ^a	18.05 ^b	23.06 ^b	0.9 ^b
HT	79.51 ^b	2.12 ^b	20.72 ^a	26.13 ^a	1.8 ^a
<i>p</i> /CTR (%)	0.000 ^{***} /27.5	0.000 ^{***} /13.3	0.000 ^{***} /16.6	0.000 ^{***} /20.2	0.000 ^{***} /26.3
Addition of tarragon essential oil					
C	81.98 ^a	1.77 ^d	15.38 ^d	20.30 ^d	0.9 ^b
F0.5	80.33 ^c	2.03 ^{cd}	18.27 ^c	23.55 ^c	0.6 ^b
F1	81.12 ^b	1.81 ^d	18.05 ^c	23.05 ^c	1.1 ^b
F1.5	80.13 ^{cd}	2.29 ^c	19.39 ^b	24.65 ^b	1.7 ^a
F2	79.57 ^{de}	3.17 ^b	22.47 ^a	27.79 ^a	2.0 ^a
F2.5	79.22 ^e	3.68 ^a	22.75 ^a	28.22 ^a	1.9 ^a
<i>p</i> /CTR (%)	0.000 ^{***} /30.6	0.000 ^{***} /60.4	0.000 ^{***} /61.9	0.000 ^{***} /65.0	0.000 ^{***} /34.7
Heat-treatment x Addition of tarragon essential oil					
UNT x C	84.46±0.89 ^a	1.66±0.70 ^f	14.75±0.96 ^g	18.67±1.07 ^f	1.3±0.50 ^{cd}
UNT x F0.5	81.11±0.68 ^b	2.49±0.31 ^{cd}	16.13±1.04 ^f	21.33±1.16 ^d	0.5±0.06 ^{cd}
UNT x F1	80.91±0.65 ^b	2.06±0.30 ^{cdef}	14.41±0.67 ^g	19.87±0.62 ^e	0.6±0.13 ^{cd}
UNT x F1.5	80.54±0.49 ^{bcd}	2.60±0.15 ^c	17.52±0.55 ^g	22.83±0.52 ^c	1.0±0.10 ^{cd}
HT x F2	80.70±1.09 ^{bc}	3.95±0.83 ^c	22.61±0.30 ^{ab}	27.57±0.56 ^a	1.2±0.28 ^{cd}
UNT x F2.5	79.90±0.53 ^{cde}	4.02±0.22 ^c	22.89±0.32 ^a	28.11±0.34 ^a	0.8±0.23 ^{cd}
HT x C	79.50±0.38 ^{ef}	1.88±0.29 ^{ef}	16.01±0.21 ^f	21.93±0.31 ^{cd}	0.5±0.08 ^d
HT x F0.5	79.54±1.19 ^{de}	1.57±0.21 ^f	20.41±1.13 ^d	25.78±1.07 ^b	0.8±0.08 ^{cd}
HT x F1	81.34±1.03 ^b	1.55±0.42 ^f	21.69±1.18 ^{bc}	26.22±1.36 ^b	1.5±0.25 ^{bc}
HT x F1.5	79.72±0.47 ^{cde}	1.97±0.27 ^{def}	21.26±0.47 ^{cd}	26.48±0.39 ^b	2.5±0.78 ^{ab}
HT x F2	78.45±0.42 ^g	2.40±0.24 ^{cde}	22.34±0.37 ^{ab}	28.02±0.39 ^a	2.8±0.71 ^a
HT x F2.5	78.53±0.33 ^{fg}	3.35±0.45 ^b	22.62±0.41 ^{ab}	28.34±0.40 ^a	2.9±0.07 ^a
<i>p</i> /CTR (%)	0.000 ^{***} /24.2	0.000 ^{***} /8.0	0.000 ^{***} /17.1	0.000 ^{***} /10.0	0.000 ^{***} /28.0

UNT-untreated films; HT-heat-treated films; C-control film; F0.5-film with 0.5% tarragon essential oil; F1-film with 1% tarragon essential oil; F1.5-film with 1.5% tarragon essential oil; F2-film with 2% tarragon essential oil; F2.5-film with 2.5% tarragon essential oil; *p*-probability; CTR (%) -percentage contribution. Values are expressed as mean ± standard deviation of twelve replicates for color parameters and three replicates for transparency. Different letters in the same column indicate statistically significant differences at $p < 0.05$ (Tukey's test). Significance: $p < 0.001$ ^{***}, extremely significant.

Table S3. Effects of heat-treatment of the film-forming solution, the addition of tarragon essential oil, and their first-degree interaction on light transmittance of edible films.

Factor	Light Transmittance (%)												
	at 200 nm	at 250 nm	at 300 nm	at 350 nm	at 400 nm	at 450 nm	at 500 nm	at 550 nm	at 600 nm	at 650 nm	at 700 nm	at 750 nm	at 800 nm
Heat-treatment													
UNT	0.06 ^b	0.04 ^b	0.07 ^b	6.23 ^a	25.37 ^a	36.89 ^a	44.19 ^a	48.88 ^a	51.66 ^a	53.21 ^a	54.29 ^a	54.88 ^a	55.34 ^a
HT	0.35 ^a	0.27 ^a	0.27 ^a	2.77 ^b	12.83 ^b	20.02 ^b	24.29 ^b	27.07 ^b	28.01 ^b	28.98 ^b	29.71 ^b	30.11 ^b	30.53 ^b
<i>p</i> /CTR (%)	0.000 ^{***} /66.6	0.000 ^{***} /71.9	0.000 ^{***} /58.4	0.000 ^{***} /19.2	0.000 ^{***} /28.0	0.000 ^{***} /28.1	0.000 ^{***} /28.1	0.000 ^{***} /28.8	0.000 ^{***} /30.1	0.000 ^{***} /30.1	0.000 ^{***} /30.3	0.000 ^{***} /30.0	0.000 ^{***} /29.7
Addition of tarragon essential oil													
C	0.33 ^a	0.15 ^a	0.26 ^a	7.74 ^a	28.73 ^a	41.35 ^a	47.43 ^{ab}	51.83 ^{ab}	54.55 ^a	56.04 ^a	57.15 ^a	57.87 ^a	58.59 ^a
F0.5	0.18 ^{ab}	0.15 ^a	0.14 ^b	4.93 ^a	27.18 ^{ab}	41.35 ^a	50.24 ^a	55.63 ^a	58.69 ^a	60.34 ^a	61.44 ^a	61.94 ^a	62.17 ^a
F1	0.20 ^{ab}	0.18 ^a	0.19 ^{ab}	4.10 ^{ab}	18.76 ^{bc}	28.40 ^b	35.15 ^{bc}	40.13 ^{bc}	40.73 ^b	42.27 ^b	43.50 ^b	43.99 ^b	44.52 ^b
F1.5	0.19 ^{ab}	0.16 ^a	0.16 ^{ab}	4.46 ^{ab}	16.76 ^c	24.06 ^{bc}	28.35 ^{cd}	30.58 ^{cd}	31.90 ^{bc}	32.64 ^{bc}	33.12 ^{bc}	33.42 ^{bc}	33.70 ^{bc}
F2	0.19 ^{ab}	0.15 ^a	0.15 ^b	0.90 ^b	7.08 ^d	14.09 ^c	19.68 ^d	23.54 ^d	26.01 ^c	27.57 ^c	28.71 ^c	29.48 ^c	30.14 ^c
F2.5	0.16 ^b	0.13 ^a	0.12 ^b	4.89 ^a	16.06 ^c	21.49 ^{bc}	24.58 ^{cd}	26.13 ^d	27.12 ^c	27.71 ^c	28.08 ^c	28.29 ^c	28.51 ^c
<i>p</i> /CTR (%)	0.058 ^{NS} /10.3	0.727 ^{NS} /1.5	0.007 ^{**} /12.4	0.001 ^{**} /25.5	0.000 ^{***} /37.7	0.000 ^{***} /39.9	0.000 ^{***} /36.5	0.000 ^{***} /36.8	0.000 ^{***} /35.5	0.000 ^{***} /35.1	0.000 ^{***} /35.1	0.000 ^{***} /34.8	0.000 ^{***} /34.6
Heat-treatment x Addition of tarragon essential oil													
UNT x C	0.24±0.26 ^{abc}	0.14±0.07 ^{bc}	0.26±0.13 ^a	11.13±3.95 ^a	29.83±9.98 ^a	37.85±12.16 ^{ab}	39.21±17.10 ^{abc}	41.86±17.36 ^{abc}	43.45±17.03 ^{bc}	44.02±17.09 ^{bc}	44.53±16.91 ^{bc}	44.91±16.67 ^{cd}	45.20±16.52 ^{cd}
UNT x F0.5	0.06±0.08 ^{bc}	0.04±0.06 ^c	0.05±0.04 ^{bc}	2.86±1.28 ^{cde}	26.38±5.61 ^a	42.80±6.34 ^a	54.60±6.03 ^a	62.12±5.67 ^a	66.27±5.34 ^a	68.54±5.35 ^a	70.02±5.37 ^a	70.61±5.38 ^{ab}	70.65±5.10 ^{ab}
UNT x F1	0.01±0.0 ^c	0.01±0.0 ^c	0.03±0.0 ^c	4.90±1.19 ^{abcde}	25.76±1.17 ^a	39.31±4.31 ^a	49.49±4.98 ^{ab}	55.44±5.51 ^{ab}	58.85±5.72 ^{ab}	60.81±5.70 ^{ab}	62.17±5.68 ^{ab}	62.88±5.61 ^{abc}	63.70±5.53 ^{abc}
UNT x F1.5	0.02±0.02 ^{bc}	0.02±0.02 ^c	0.03±0.01 ^c	8.26±1.46 ^{abc}	29.79±0.88 ^a	40.75±1.13 ^a	46.94±1.91 ^{ab}	50.01±2.49 ^{ab}	51.89±2.75 ^{ab}	52.97±2.68 ^{ab}	53.67±2.72 ^{ab}	54.09±2.87 ^{abc}	54.41±2.77 ^{abc}
HT x F2	0.02±0.01 ^{bc}	0.02±0.01 ^c	0.04±0.01 ^c	0.85±0.42 ^{de}	10.10±2.32 ^b	21.42±3.00 ^{bc}	30.81±3.92 ^{bc}	37.40±5.08 ^{bc}	41.54±5.96 ^{bc}	44.11±6.66 ^{bc}	46.03±7.12 ^{bc}	47.27±7.51 ^c	48.30±7.77 ^c
UNT x F2.5	0.02±0.01 ^{bc}	0.02±0.01 ^c	0.03±0.01 ^c	9.39±3.75 ^{ab}	30.34±6.88 ^a	39.21±7.93 ^a	44.06±8.29 ^{ab}	46.45±8.62 ^{ab}	47.94±8.65 ^{ab}	48.81±8.58 ^{ab}	49.31±8.45 ^{ab}	49.56±8.33 ^{bc}	49.80±8.21 ^{bc}
HT x C	0.42±0.15 ^a	0.17±0.10 ^{bc}	0.26±0.03 ^a	4.34±1.09 ^{bcdde}	27.64±3.17 ^a	44.84±3.82 ^a	55.65±4.13 ^a	61.80±4.23 ^c	65.66±4.34 ^a	68.06±4.15 ^a	69.75±4.18 ^a	70.83±4.44 ^a	71.98±4.42 ^a
HT x F0.5	0.30±0.03 ^{ab}	0.25±0.05 ^{ab}	0.23±0.03 ^a	7.01±3.57 ^{abcd}	27.98±4.21 ^a	39.90±1.71 ^a	45.89±0.16 ^{ab}	49.14±1.06 ^{ab}	51.10±1.51 ^{ab}	52.14±1.68 ^{ab}	52.86±1.71 ^{ab}	53.27±1.69 ^{abc}	53.68±1.77 ^{abc}
HT x F1	0.39±0.07 ^a	0.36±0.09 ^a	0.35±0.08 ^a	3.30±2.32 ^{bcdde}	11.77±5.12 ^b	17.49±5.23 ^{cd}	20.82±4.93 ^{cd}	24.82±3.58 ^{cd}	22.61±4.49 ^{cd}	23.74±4.15 ^{cd}	24.82±3.58 ^{cd}	25.10±3.36 ^{de}	25.34±3.22 ^{de}
HT x F1.5	0.35±0.04 ^a	0.31±0.04 ^{ab}	0.28±0.04 ^a	0.65±0.53 ^c	3.72±4.30 ^b	7.37±7.44 ^{cd}	9.75±9.00 ^d	11.14±9.74 ^d	11.92±9.99 ^d	12.31±9.93 ^d	12.57±9.76 ^d	12.75±9.65 ^e	12.99±9.68 ^e
HT x F2	0.35±0.08 ^a	0.29±0.10 ^{ab}	0.26±0.10 ^a	0.96±0.81 ^{de}	4.07±3.31 ^b	6.77±4.63 ^{cd}	8.56±5.02 ^d	9.68±4.95 ^d	10.47±4.79 ^d	11.03±4.55 ^d	11.40±4.21 ^d	11.69±3.89 ^e	11.98±3.56 ^e
HT x F2.5	0.30±0.05 ^{ab}	0.24±0.03 ^{ab}	0.22±0.05 ^{ab}	0.38±0.15 ^c	1.79±0.77 ^b	3.77±1.13 ^d	5.13±1.71 ^d	5.09±1.21 ^d	6.29±1.19 ^d	6.60±1.21 ^d	6.86±1.26 ^d	7.03±1.26 ^e	7.22±1.27 ^e
<i>p</i> /CTR (%)	0.532 ^{NS} /3.5	0.003 ^{**} /13.5	0.003 ^{**} /15.0	0.000 ^{***} /19.7	0.000 ^{***} /23.5	0.000 ^{***} /23.2	0.000 ^{***} /26.0	0.000 ^{***} /26.0	0.000 ^{***} /26.8	0.000 ^{***} /27.5	0.000 ^{***} /28.0	0.000 ^{***} /28.5	0.000 ^{***} /29.2

UNT-untreated films; HT-heat-treated films; C-control film; F0.5-film with 0.5% tarragon essential oil; F1-film with 1% tarragon essential oil; F1.5-film with 1.5% tarragon essential oil; F2-film with 2% tarragon essential oil; F2.5-film with 2.5% tarragon essential oil; *p*-probability; CTR (%)-percentage contribution. Values are expressed as mean ± standard deviation of three replicates. Different letters in the same column indicate statistically significant differences at $p < 0.05$ (Tukey's test). Significance: $p \geq 0.05$ ^{NS}, not significant; $p < 0.01$ ^{**}, very significant; $p < 0.001$ ^{***}, extremely significant.

Table S4. Effects of heat-treatment of the film-forming solution, the addition of tarragon essential oil, and their first-degree interaction on puncture resistance and puncture deformation of edible films.

Factor	Puncture Resistance (N/mm)	Puncture Deformation (mm)
Heat-treatment		
UNT	1.6 ^b	6.5 ^a
HT	3.3 ^a	5.1 ^b
<i>p</i> /CTR (%)	0.000 ^{***} /19.0	0.000 ^{***} /18.8
Addition of tarragon essential oil		
C	4.9 ^a	7.8 ^a
F0.5	1.6 ^c	5.3 ^{bc}
F1	1.6 ^c	4.6 ^c
F1.5	1.6 ^c	5.3 ^{bc}
F2	1.4 ^c	5.1 ^c
F2.5	3.6 ^b	6.6 ^{ab}
<i>p</i> /CTR (%)	0.000 ^{***} /48.6	0.000 ^{***} /38.1
Heat-treatment x Addition of tarragon essential oil		
UNT x C	6.2±0.921 ^a	10.0±0.684 ^a
UNT x F0.5	0.4±0.041 ^f	6.3±1.149 ^{bc}
UNT x F1	0.4±0.098 ^f	5.3±1.190 ^{bcd}
UNT x F1.5	0.4±0.078 ^f	6.1±1.312 ^{bcd}
HT x F2	0.7±0.190 ^{ef}	5.6±1.809 ^{bcd}
UNT x F2.5	1.5±0.064 ^{de}	5.9±0.109 ^{bcd}
HT x C	3.6±0.675 ^b	5.6±0.291 ^{bcd}
HT x F0.5	2.9±0.148 ^{bc}	4.3±0.484 ^{cd}
HT x F1	2.7±0.244 ^{bc}	4.0±0.051 ^d
HT x F1.5	2.8±0.169 ^{bc}	4.6±0.289 ^{cd}
HT x F2	2.1±0.064 ^{cd}	4.7±0.218 ^{cd}
HT x F2.5	5.6±0.791 ^a	7.2±0.737 ^b
<i>p</i> /CTR (%)	0.000 ^{***} /28.8	0.000 ^{***} /24.1

UNT-untreated films; HT-heat-treated films; C-control film; F0.5-film with 0.5% tarragon essential oil; F1-film with 1% tarragon essential oil; F1.5-film with 1.5% tarragon essential oil; F2-film with 2% tarragon essential oil; F2.5-film with 2.5% tarragon essential oil; *p*-probability; CTR (%)-percentage contribution. Values are expressed as mean ± standard deviation of four replicates. Different letters in the same column indicate statistically significant differences at $p < 0.05$ (Tukey's test). Significance: $p < 0.001^{***}$, extremely significant.