

Supplementary Materials

Supplementary Table S1: Inhibition growth of three pathogenic strains on the prepared Active Packaging after 24 h of incubation (ISO 22196:2011). U0: Counts bacteria recovered from non treated specimens after the inoculums; Ut: Count of bacteria recovered from non-treated samples after 24 h from inoculation; At: Count of bacteria recovered from treated samples after 24 h from inoculation. R: Antibacterial activity

Bacterial strain	<i>P. aeruginosa</i> ATCC 15442	<i>E. coli</i> ATCC 8739	<i>S. aureus</i> ATCC 6538
Sample size	50 x 50 (mm x mm)	40 x 40 (mm x mm)	40 x 40 (mm x mm)
Sample thickness	1.0 mm	0.070 mm	0.070 mm
Inoculum volume	0.4 mL	0.4 mL	0.4 mL
U ₀	4.4±0.0026 (Log CFU/cm ²)	4.3±0.0024 (Log CFU/cm ²)	4.1±0.0021 (Log CFU/cm ²)
U _t	5.3±0.0032 (Log CFU/cm ²)	5.7±0.0034 (Log CFU/cm ²)	5.4±0.0035 (Log CFU/cm ²)
At	n.d.*	4.6±0.0025 (Log CFU/cm ²)	3.8±0.0021 (Log CFU/cm ²)
R = (U _t -U ₀)-(At-U ₀)	>4.3	1.1	1.6

*not detectable (< limit of detection, DL=1)

Supplementary Table S2: Global migration and specific migration of salicylic acid from the Active Packaging

Simulant	B – Acetic acid at 3% (v/v)	D1 – Ethanol at 50% (v/v)	Limits
	Global migration into aqueous food simulant by filling a container UNI EN 1186-1: 2003 + UNI EN 1186-9: 2003	Global migration into aqueous food simulant by filling a container UNI EN 1186-1: 2003 + UNI EN 1186-9: 2003	
Temperature of the test	40 °C	40 °C	
Contact time	10 days	10 days	
Global migration average in the simulant	7.4 (mg/dm ²)	8.7 (mg/dm ²)	10 (mg/dm ²)

Supplementary Table S3: Texture profile analysis of Mozzarella cheese samples stored at 4 and 15°C in coated and uncoated packages for 10 days*

	Hardness (N)	Cohesiveness	Springiness	Chewiness (N)
Coated_4°C	10.34 ± 0.98 b	0.77 ± 0.05 a	0.88 ± 0.03 a	7.06 ± 1.33 b
Uncoated_4°C	10.04 ± 1.04 b	0.77 ± 0.02 a	0.87 ± 0.01 a	6.64 ± 0.71 b
Coated_15°C	9.79 ± 1.21 b	0.68 ± 0.06 b	0.85 ± 0.02 a	5.69 ± 0.93 b
Uncoated_15°C	6.34 ± 0.12 c	0.60 ± 0.02 c	0.83 ± 0.05 a	3.16 ± 0.04 c
Control**	12.52 ± 0.41 a	0.79 ± 0.01 a	0.90 ± 0.01 a	8.92 ± 0.26 a

*The values represent means ± standard deviation (N = 3). Values within each column showing different subscript letters represent are significantly ($P < 0.05$) different according to Duncan's *post hoc test*.

**Control are Mozzarella cheese produced on day of analysis.

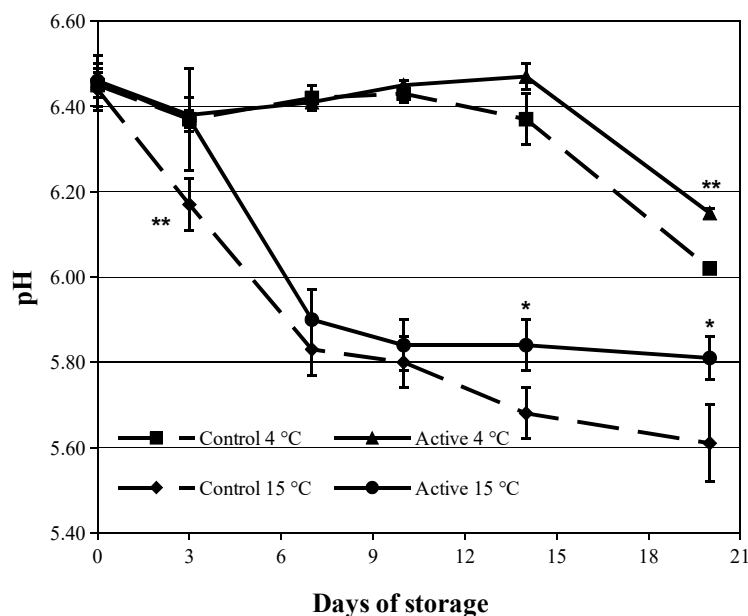
Supplementary Table S4: CIELab coordinates of Mozzarella cheese samples stored at 4 and 15 °C in coated and uncoated packages for 10 days*

	L*	a*	b*	H°	C*
Coated_4°C	95.93 ± 0.17 a	-1.46 ± 0.08 a	6.01 ± 0.20 b	103.62 ± 0.34 b	6.18 ± 0.21 b
Uncoated_4°C	95.86 ± 0.07 a	-1.56 ± 0.04 b	6.34 ± 0.10 b	103.85 ± 0.19 b	6.53 ± 0.11 b
Coated_15°C	95.98 ± 0.19 a	-1.51 ± 0.04 b	6.85 ± 0.20 a	102.47 ± 0.38 b	7.01 ± 0.20 a
Uncoated_15°C	94.79 ± 1.25 a	-1.61 ± 0.05 b	6.73 ± 0.59 a	103.51 ± 0.92 b	6.92 ± 0.58 a
Control**	95.23 ± 0.07 a	-1.59 ± 0.03 b	6.02 ± 0.16 b	104.77 ± 0.22 a	6.22 ± 0.16 b

*The values represent means ± standard deviation (N = 3). Values within each column showing different subscript letters represent are significantly ($P < 0.05$) different according to Duncan's *post hoc test*.

**Control are Mozzarella cheese produced on day of analysis

Supplementary Figure S1: pH values of Mozzarella cheese samples packed with governing liquid in active and control packaging and stored at 4 °C and 15 °C. Values represents average \pm standard deviation (N = 3). *, **: significant pairwise differences ($P < 0.05$; $P < 0.001$, respectively) between control and active samples at the same incubation temperature following 2-tailed independent Student's t test ($P < 0.05$).



Supplementary Figure S2: Free amino acids and small peptide contents (FAA, $\mu\text{g/mL}$, as glycine equivalent) registered in governing liquid of Mozzarella cheese samples packed in active and control trays during incubation at 15 and 4 °C for 20 days. Bars represent average \pm standard deviation (N = 3). *, **: significant pairwise differences ($P < 0.05$; $P < 0.001$, respectively) between control and active samples at the same incubation temperature according to 2-tailed independent Student's t test ($P < 0.05$); n.s.: not significant.

