

1 **Table. S1.** Volume, color and crumb image analysis of bread manufactured with wheat flour fortified with apple by-products (ABP). Raw ABP
2 (Raw-ABP), and chemically acidified ABP (CA-ABP) and Fermented-ABP, which were previously incubated at 30°C for 48 h. Fermentation
3 (Fermented-ABP) was with the selected binary culture of *Weissella cibaria* PEP23F and *Saccharomyces cerevisiae* AN6Y19. Raw-ABP, CA-ABP
4 and Fermented-ABP were added at concentrations of 5 and 10% (w w⁻¹ of flour). Baker's yeast wheat bread (BY), manufactured without addition of
5 ABP, was the control. Data are the means (\pm SD) of three independent experiments analyzed in triplicate. Data were subjected to one-way ANOVA
6 followed by Tukey's procedure at P < 0.05.

	BY	Raw-ABP (5% w w ⁻¹ of flour)	Raw-ABP (10% w w ⁻¹ of flour)	CA-ABP (5% w w ⁻¹ of flour)	CA-ABP (10% w w ⁻¹ of flour)	Fermented- ABP (5% w w ⁻¹ of flour)	Fermented- APB (10% w w ⁻¹ of flour)
Specific volume (cm³ g⁻¹)	2.48 \pm 0.15 ^a	2.14 \pm 0.15 ^b	2.12 \pm 0.15 ^{bc}	2.42 \pm 0.12 ^a	2.00 \pm 0.12 ^c	2.43 \pm 0.23 ^{ab}	2.08 \pm 0.18 ^{bc}
pH	5.91 \pm 0.09 ^a	5.36 \pm 0.08 ^b	4.96 \pm 0.12 ^c	4.72 \pm 0.13 ^{cd}	4.23 \pm 0.15 ^e	4.85 \pm 0.15 ^c	4.45 \pm 0.14 ^{de}
Crust color analysis							
<i>dE_{ab}</i> *	34.7 \pm 2.3 ^c	41.6 \pm 1.8 ^{ab}	44.8 \pm 1.6 ^a	36.9 \pm 1.7 ^c	37.3 \pm 1.8 ^c	38.8 \pm 2.2 ^{bc}	38.0 \pm 1.8 ^c
Crumb image analysis							
Black pixel area (%)	41.65 \pm 1.6 ^b	42.06 \pm 1.0 ^b	37.28 \pm 1.1 ^c	52.28 \pm 1.7 ^a	44.38 \pm 1.4 ^b	35.76 \pm 0.8 ^c	31.22 \pm 0.5 ^d

7 ^{a-c} Means within the row with different letters are significantly different (P < 0.05).

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