

IN VITRO DIGESTION METHOD ADAPTED FOR CAROTENOIDS AND CAROTENOID ESTERS: MOVING FORWARD TOWARDS STANDARDIZATION

Daniele Bobrowski Rodrigues, Lilian Regina Barros Mariutti[#] and Adriana Zerlotti Mercadante*

Electronic Supplementary Material

Table S.1 Amount of enzymes (g) used per each 1.0 g of rehydrated murici in *in vitro* bioaccessibility protocols.

	Xavier modified	INFOGEST adapted
α-amylase	na	0.0019
pepsin	0.005	0.01
pancreatin	0.08	0.006
lipase	0.0132	na

na=not applicable

Table S.2 Carotenoid content ($\mu\text{g}\cdot\text{g}^{-1}$ dw) from murici fruit and its micellar fractions obtained after *in vitro* digestion protocols.

Peak ^a	Carotenoid	Murici fruit	Xavier modified	Xavier modified + SF	INFOGEST adapted
1	(13Z)-lutein or (13'Z)-lutein	1.2 ± 0.0	0.3 ± 0.1	0.2 ± 0.0	0.2 ± 0.0
2	(all-E)trans-lutein	11.7 ± 0.5	2.3 ± 0.4	0.7 ± 0.2	3.4 ± 0.3
3	(all-E)-zeaxanthin	3.7 ± 0.2	0.5 ± 0.1	0.2 ± 0.1	0.8 ± 0.1
4	(9Z)-lutein	1.0 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.3 ± 0.0
5	(9'Z)-lutein	1.0 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
6	(all-E)-neochrome myristate	1.0 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
7	(all-E)-neochrome palmitate + lutein 3'-O-caprate + lutein 3-O-caprate	1.3 ± 0.1	0.3 ± 0.0	0.2 ± 0.0	0.3 ± 0.0
8	(Z)-lutein 3'-O-laurate	1.0 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
9	(Z)-lutein 3-O-laurate	1.2 ± 0.0	0.2 ± 0.0	0.2 ± 0.0	0.2 ± 0.0
10	(13Z)-lutein 3-O-myristate	0.7 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
11	(all-E)-lutein 3'-O-myristate	1.3 ± 0.1	0.3 ± 0.0	0.2 ± 0.0	0.3 ± 0.0
12	(13'Z)-lutein 3-O-myristate	0.8 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
13	(all-E)-lutein 3-O-myristate + (all-E)- β -carotene	3.7 ± 0.1	0.5 ± 0.0	0.3 ± 0.1	0.6 ± 0.1
14	(13Z)-lutein 3-O-palmitate or (13'Z)-lutein 3-O-palmitate	0.8 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
15	zeaxanthin myristate	0.6 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0
16	(all-E)-lutein 3-O-palmitate	1.1 ± 0.0	0.2 ± 0.0	0.1 ± 0.0	0.2 ± 0.0

17	(<i>Z</i>)-violaxanthin dimyristate	1.5 ± 0.1	0.1 ± 0.0	0.1 ± 0.0	0.3 ± 0.0
18	(<i>Z</i>)-violaxanthin myristate palmitate	1.8 ± 0.1	0.1 ± 0.0	0.2 ± 0.0	0.3 ± 0.0
19	(<i>Z</i>)-violaxanthin myristate palmitate	1.2 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
20	(<i>Z</i>)-violaxanthin dipalmitate	0.7 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
21	β-cryptoxanthin myristate+ lutein dilaurate	0.9 ± 0.0	0.1 ± 0.0	0.2 ± 0.0	0.2 ± 0.0
22	(all- <i>E</i>)-lutein 3- <i>O</i> -myristate-3'- <i>O</i> -laurate	2.3 ± 0.1	0.2 ± 0.0	0.2 ± 0.0	0.5 ± 0.0
23	(13 <i>Z</i>)-lutein dimyristate	1.4 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.3 ± 0.0
24	(13' <i>Z</i>)-lutein dimyristate	1.0 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
25	(all- <i>E</i>)-lutein dimyristate	5.1 ± 0.2	0.2 ± 0.0	0.3 ± 0.1	0.9 ± 0.1
26	(<i>Z</i>)-lutein 3- <i>O</i> -myristate-3'- <i>O</i> -palmitate	1.4 ± 0.0	0.1 ± 0.0	0.2 ± 0.0	0.3 ± 0.0
27	(<i>Z</i>)-zeaxanthin dimyristate	1.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
28	(all- <i>E</i>)-lutein 3- <i>O</i> -myristate-3'- <i>O</i> -palmitate + (all- <i>E</i>)-lutein 3'- <i>O</i> -myristate-3- <i>O</i> -palmitate	3.0 ± 0.1	0.2 ± 0.0	0.2 ± 0.0	0.6 ± 0.0
29	(<i>Z</i>)-lutein myristate-palmitate	0.9 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.2 ± 0.0
30	(all- <i>E</i>)-lutein dipalmitate	1.1 ± 0.0	0.1 ± 0.0	0.1 ± 0.0	0.3 ± 0.0
Total		55.9 ± 1.4	8.3 ± 0.6	5.4 ± 0.6	12.4 ± 0.8

Carotenoids were quantified by HPLC-DAD using external analytical curves. Carotenoid contents are expressed as mean ± sd (n=3). ^a Numbered according to Figure 2.