





Replacing Artificial Alternatives to Red 3/ Erythrosine/ E127

Givaudan
Human by nature

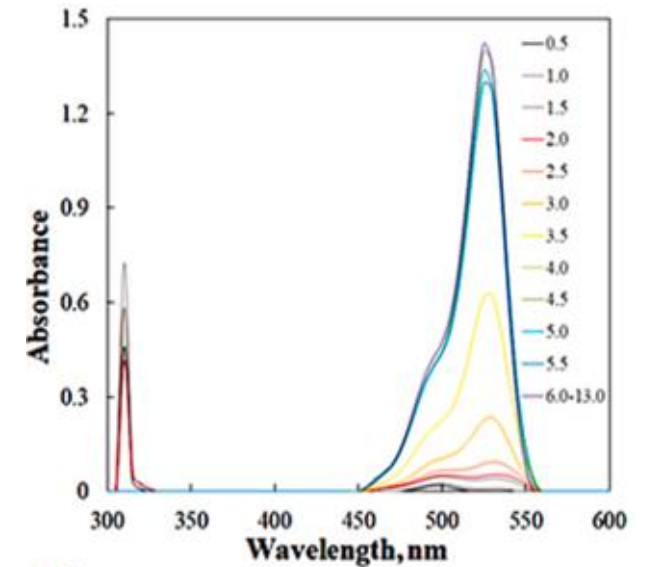
Red 3 Overview

Erythrosine / FD&C Red 3 / E127

- Reduces in intensity as the pH decreases
 - Maximum absorbance λ 527 nm, slightly bluish-pink color
 - Has fluorescent properties (emits at 548 nm)
 - Soluble in water and ethanol
 - Stable to normal heat processing in the manufacturing of foods and beverages
-
- Synthetic color in the Xanthene family
 - Revoked by the US FDA in 2025 due to the Delaney Clause
 - Acceptable Daily Intake (ADI) of 0,1 mg/kg bw/day, according to JECFA and ratified by EFSA (EU)
 - Mentioned in McCann et al., 2007 (Southampton Study) as one of the 6 synthetic colors that can impact the attention level of children.

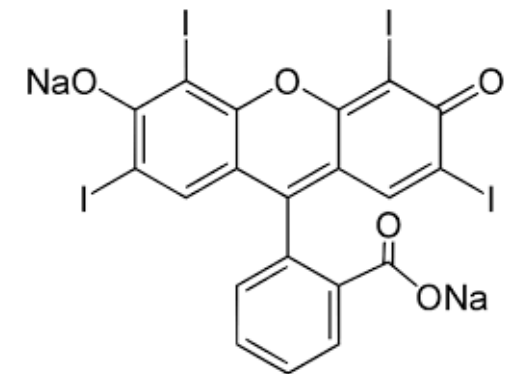


pH 4.5-7.0



Absorbance spectrum of aqueous solutions of erythrosine at different pH levels

Source: Snigur, et al. Dyes and Pigments, 2022



Natural Options



Red Beet (betalains)

- Obtained from red beets
- Magenta shade (due to betacyanins, the most abundant betalain)
- Max absorbance at λ 530-535 nm (very close to Red 3)
- Options with improved stability to heat are available (Endure Red Beet)
- Very light sensitive in applications with high water activity



pH 3.0-7.0





Carmines

- Anthraquinone derivative
- Not Kosher or Halal
- Animal origin
- Required declaration by name (FDA USA)
- Magenta shade
- Max absorbance at λ 520 nm (a little less blue than Red 3)
- Precipitates in acidic environments and can shift to orange
- Can be stabilized for certain applications with moderate acidity (yogurt)



pH 4.0-7.0





Anthocyanins

- Flavonoid derivatives
- Wide range of red, magenta, and pink shades depending on the source
- Sensitive to pH changes, shifting towards violets and blues as the pH increases.
- Heat and light stability is best when applied in the ideal pH range (acidic)
- The commercial sources that appear the most pink are purple sweet potato and y purple cabbage with max absorbances at λ 530 nm, very close to Red 3



pH 2.5-7.0



Pink

Collection at a glance

Color Shades		Name	Form	Main Ingredient	Confections	Beverages	Frozen Desserts
		Red Beet	LWS/P	Red Beet Extract	Y	Y (instant)	Y
		Vegebrite® Red Beet	LWS/P	Red Beet Extract	Y	Y (instant)	Y
		michroma™ red beet	LOD	Red Beet Extract	Y (fat coating)	Y (instant)	
		Purple Sweet Potato	LWS/P	Purple Sweet Potato Extract	Y	Y	Y
		Vegebrite® Raspberry	LWS/P	Purple Sweet Potato Concentrate	Y	Y	Y
		Magento	LWS	Red Cabbage Extract	Y	Y	Y
		Carmine	LWS/P	Carmine	Y	Y (instant)	Y
		michroma™ carmine	LOD	Carmine	Y (fat coating)	Y (instant)	

Bakery

Cakes



Red 3



Acidified Radish



Carmines



Carmines

Macarons



Red 3



Beet



Carmines



Carmines

Givaudan

Frostings & Fillings

Buttercreams



Red 3



Vegebrite®
michroma® Beet



michroma® Beet



michroma®
Carmine



michroma®
Carmine



michroma® Beet

Fat Fillings



Red 3



Vegebrite®
michroma®+ Beet



michroma® Beet



michroma®+ Beet



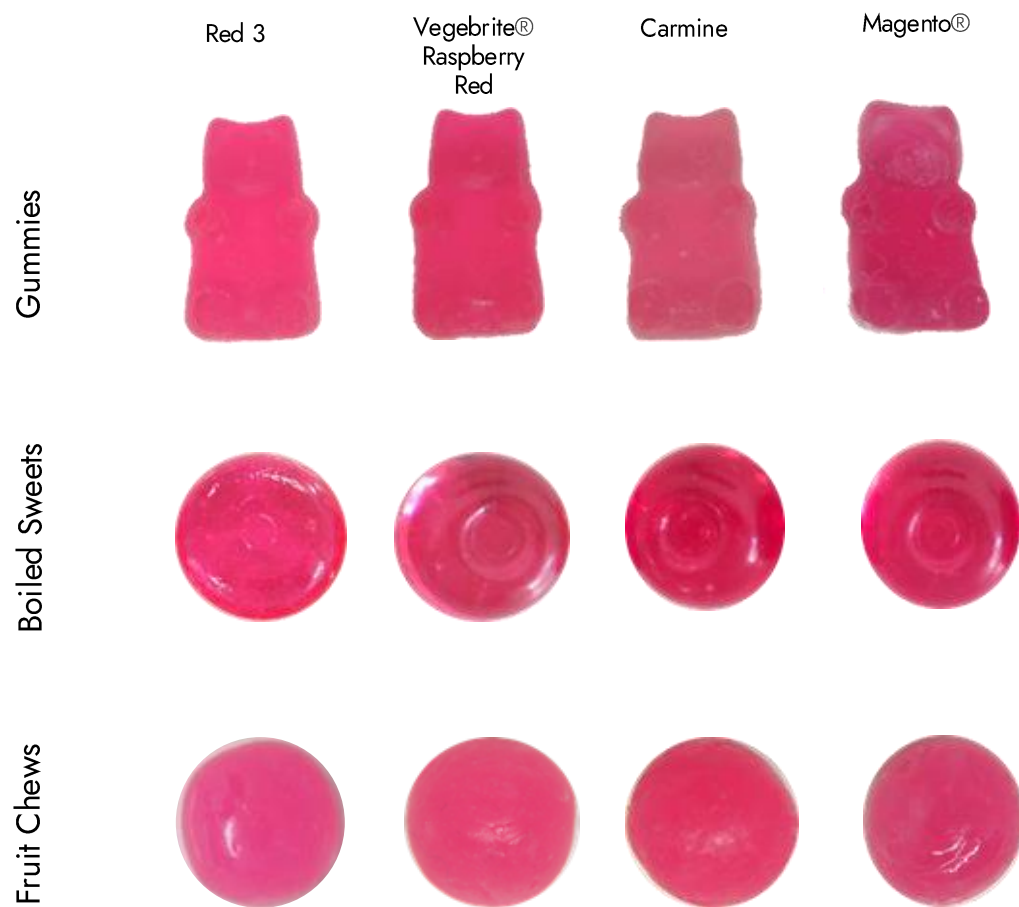
michroma®+ Radish



michroma®+ Carmine

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Confections



Note: The applications with anthocyanins are adjusted to pH 3,0

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Confections

Panned Candies



Red 3



Red Beet



Vegebrite® Red Beet



Purple Sweet Potato



Carmine

White Chocolate



Red 3



Michroma red
beet



michroma®
beet powder



michroma®
Carmine



michroma®
Carmine



michroma®
Beetroot

Dairy

Milk

Red 3



Red Beet



Carmine



Purple Sweet Potato



Ice Cream



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Frozen Desserts



Beverages

Red 3



Carmine



Red beet



Dragonberry red



Red Cabbage



Purple Sweet
Potato



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Note: The applications with anthocyanins are adjusted to pH 3.0

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