

Eating with Your Eyes...The Chemistry of Food Coloring

Anticipation Guides

Anticipation guides help engage students by activating prior knowledge and stimulating student interest before reading. If class time permits, discuss students' responses to each statement before reading each article. As they read, students should look for evidence supporting or refuting their initial responses.

Directions: *Before reading*, in the first column, write "A" or "D" indicating your agreement or disagreement with each statement. As you read, compare your opinions with information from the article. In the space under each statement, cite information from the article that supports or refutes your original ideas.

Me	Text	Statement
		1. About 30% of the diet of the average U. S. resident is from processed foods.
		2. People have used natural food dyes for centuries.
		3. All anthocyanins have the same molecular structure.
		4. Some red food dye comes from insects.
		5. Synthetic food dyes are more expensive than natural food dyes.
		6. Most synthetic food dyes are made from petroleum.
		7. Food coloring molecules are usually nonpolar solids.
		8. Blue dye absorbs mostly red, orange, and yellow light.

		9. Food coloring molecules usually have alternating single and double bonds that allow electrons to be excited at relatively low energy.
		10. Natural products are always healthier than artificial ones.

Eating with Your Eyes: The Chemistry of Food Colorings

Directions: As you read, complete the graphic organizer below to compare and contrast natural and artificial food dyes. You could include information found in the infographic on page 19 of this issue of *ChemMatters*.

	Natural Food Dyes	Artificial Food Dyes
Examples, including colors		
Advantages		
Disadvantages		
How they work		

In September 2014, Burger King announced the introduction of black colored cheese burgers complete with black buns, black sauce and black cheese. The “Kuro Burger”, translated as “Black Burger”, was a tremendous hit in Japanese establishments. The buns and cheese are colored with bamboo charcoal; the sauce is made of garlic, onions, and squid ink; and the hamburger patty is generously spiced with black pepper before grilling.

The Black Burgers were not as welcome in North America. Hayley Peterson, a reporter for *businessinsider*, says, “Burger King Japan's black burgers look unbelievably gross in real life.” Here is the link to the article: <http://www.businessinsider.com/burger-kings-black-burgers-look-gross-2014-9>.



The Japanese Kuro Burger at Burger King

Somewhat similar but more descriptive comments came from Josh Elliott of *Canadian CTVNews*. Josh said, “People have certain expectations when it comes to food and drink. Corn is yellow, coffee is black and chicken is white. But would you try teal corn, red chicken or blue coffee?” Burger King did not attempt to introduce the black burgers to the Canadian market. Here is the link to the article: <http://www.ctvnews.ca/business/black-burgers-the-newest-offering-in-crazy-coloured-food-1.2004111>. Check out the colored ketchup on this website.

McDonald’s quickly produced a black burger knockoff, so rival Burger King introduced the “Aka Burger” (aka means red in Japanese). Beginning in July 2015, Aka Burgers were available in Samurai Beef and Samurai Chicken with a red bun and red cheese.



Burger King’s Aka Samurai Beef Burger

The *Wall Street Journal* reports that the aka burger is served with a red hot sauce made from miso and red hot peppers. Also, to keep ahead of the curve, Burger King will add deep-fried eggplant to its black burger producing the new “Kuro Shogun” (at right) which debuted on August 21, 2015.

Questions:

1. Identify other “color” oddity food or drink that have come out over the last few years.
2. Would you eat a Kuro Burger? Aka Burger? Kuro Shogun? Purple ketchup? Explain.
3. When I was a kid the red M&Ms were taken out of the packages. Research this happening in history. What happened and why?

4. Find 3 food products in your home. Look at the ingredients. Find the colorant that is used in your food items. Make sure to list the food item as well as the color found in the food item.
5. The information in the following table was taken from the food dyes article. Check the Internet to research additional natural food coloring pigments. Add them to this list:

Natural Food Coloring Pigment	Color	Food Use
chlorophyll	Green	mint or lime flavored candy or ice cream
anthocyanin	deep purple/blue	blue corn chips, colored soft drinks, grape jelly
turmeric	deep yellow	mustard, Indian foods (curry)
1.		
2.		
3.		
4.		
5.		