Artificial Dyes Found in Surprising Places

What was once reserved for colorful, celebratory cake frosting is now lurking on almost every shelf in the grocery store. In fact, consumption of food dyes has increased 5-fold since 1955 (up from 3 million to 15 million pounds per year) – 90% of which is from Yellow 5, Yellow 6, and Red 40. This is one of the many reasons why the argument that we grew up eating this stuff and turned out "just fine" doesn't hold up – processed food has changed (and continues to change) since we were kids. So nowadays unless you shop somewhere like Whole Foods or Earth Fare (supermarkets that don't allow products with artificial dyes), get ready to do some label reading in order to avoid the above list on your next shopping trip.

You will see some examples where we found artificial food dyes. They are not just found in neon colored beverages and brightly colored candies – all of the following **(even including brown cereal, whole-wheat pizza crust, pickles and even children's medication!)** are examples of packaged products that contain artificial dyes:

Ingredients

WHOLE GRAIN ROLLED OATS, SUGAR, FLAVORED AND COLORED FRUIT PIECES (DEHYDRATED APPLES [TREATED WITH SODIUM SULFITE TO PROMOTE COLOR RETENTION], ARTIFICIAL STRAWBERRY FLAVOR, CITRIC ACID, RED 40), CREAMING AGENT (MALTODEXTRIN, PARTIALLY HYDROGENATED SOYBEAN OIL**, WHEY, SODIUM CASEINATE), SALT, CALCIUM CARBONATE, GUAR GUM, OAT FLOUR, ARTIFICIAL FLAVOR, CITRIC ACID, NIACINAMIDE*, REDUCED IRON, VITAMIN A PALMITATE, PYRIDOXINE HYDROCHLORIDE*, RIBOFLAVIN*, THIAMIN MONONITRATE*, FOLIC ACID*.

*ONE OF THE B VITAMINS

**ADDS A DIETARILY INSIGNIFICANT AMOUNT OF TRANS FAT

by Lauri Pratt

Science fair projects are a "hands-on" way for children to learn about the effects of synthetic food additives.

After reading a magazine article about an experiment done by another sixth grader, Taylor wanted to do his own yellow dye #5 challenge on some mice. We were a little hesitant to agree to the experiment he titled "Fuzzy Brained Mice," because we were not sure how it would turn out. Nevertheless, we headed out to the pet store and purchased four mice. Fortunately, we already had two cages, water bottles, and wheels for hamsters that we had previously owned. After researching maze design on line, my husband decided to design one with Taylor, using graph paper. They built the maze with a plywood base. After drawing the plans onto the wood, they hot-glued the fiberboard walls into place. All the wood was cut by a very generous man at Home Depot. Once it was completed, Taylor chose to paint it his favorite color, orange. Together, father and son sprayed it a cool fluorescent orange and green, finishing the construction in one afternoon.

Taylor separated his mice into two groups of two, and initially fed and watered them equally while he trained them to run the maze. After about three weeks of training, all four mice were running the maze with similar times of about twenty seconds. Then, he gave one set of mice 1/4 tsp of liquid Yellow Dye #5 in their 6 oz bottle of water.

We waited anxiously the next morning to see what the results would be. Would there be a change in one day? After all, the amount of coloring in the water was barely visible. How could it do anything?

The results were dramatic. The two mice who received the dye in their water had increased their maze time from about 20 seconds to over 100 seconds! Their performance continued to deteriorate over the next three days until they reached a maze time of more than 200 seconds (see the chart below). Even though they had previously known the maze route as well as the Pure Water Mice, they were confused and took dead-ends continuously. Additionally, one Yellow Dye Mouse became aggressive and attacked its cage mate.

After documenting the poor performance of the “fuzzy brained mice”, Taylor removed the dye from the water and gave the impaired mice pure water again for one week. He then retested all four mice, and the two Yellow Dye Mice’s performance once again was about twenty seconds like the other two. Their brains had retained the information of how to run the maze, but the dye had so disable their ability to think clearly that they could not do it.

Average Daily Maze Time in Seconds

Here are the results for Taylor's mice.
* Yellow dye was added to water for mouse 1 and 2 beginning on 11/7

DATE	MOUSE 1	MOUSE 2	MOUSE 3	MOUSE 4
11/1/2004	48	56	47	65
11/2/2004	34	39	39	52
11/3/2004	35	32	33	23
11/5/2004	21	34	25	20
11/6/2004	18	17	21	17
11/7/2004 *	109	105	20	16
11/8/2004	145			

NOTES:

1. The mice drank as much of the yellow water as they did of the pure water, so the difference in performance was not a result of dehydration.
2. The amount of coloring used was 1/4 tsp liquid yellow food coloring per 6 oz of water.
    - The colored water was so pale that Taylor did not think it could possibly make any difference, and he was surprised at the dramatic deterioration in performance ability he documented.
3.
4. Why don't the scientific studies show the same results?
    - They do, when they use a maze.
    - In 1982, Shaywitz reported on a study of rat pups which were given food dyes at .5 mg/kg (only a tenth of the amount that Taylor used). Nevertheless, after eating the dye, the rats took more than twice as long to escape from a maze that they had already learned.
    - Most of the scientfic studies of the effects of coloring, however, measure weight change, swimming ability, wheel running, etc. Most of them do **not** use a maze or other learned behavior patterns to test the animal's ability to think and remember.