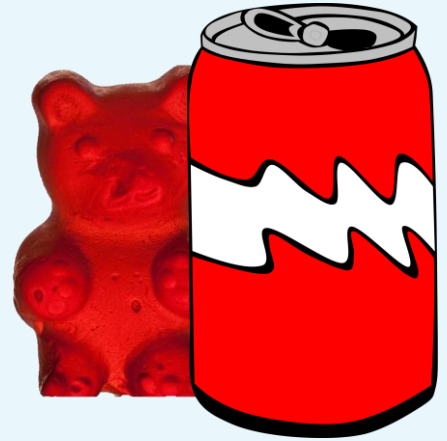


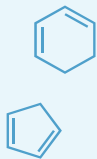
The Health Effects of Allura Red

By: Nuriyah Shariff

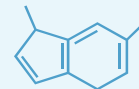


**What Are the
Health Effects
of Allura Red?**

Thesis



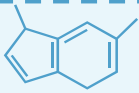
Allura Red can cause a variety of health effects which can affect a person both physically and mentally.



What is Allura Red?

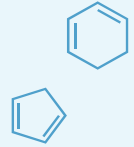
- Allura Red is a coloured dye that has multiple uses
- It has many other names, for example Red.40
- It is one of the 9 approved food additives by the Food and Drug Administration (FDA)
- It is most commonly used in food but in other products as well
- In many countries Allura Red has been banned
- An acceptable daily intake of Allura Red has been created by Joint Expert Committee on Food Additives (JECFA)
- The Acceptable Daily Intake (ADI) is 0-7 mg/kg/day
- Allura Red is in foods that often attract children





Examples of Allura Red in Food and Beverages

- ❖ Candy & Gum
- ❖ Cakes & Frosting
- ❖ Cereals
- ❖ Chips
- ❖ Energy Drinks
- ❖ Gelatins
- ❖ Ice Cream
- ❖ Baked Goods
- ❖ Sports Drinks
- ❖ Yogurt
- ❖ Pain relievers
- ❖ Spices & Powder Mixes
- ❖ Dressings & Sauces



Examples Amounts

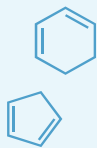


20 oz Red Gatorade=15 to 42.7 mg

In order to actually reach the limit you would have to drink about 10 liters of Gatorade per day.



Original Skittles=33.3mg/serving



Ingestion

There are multiple ways for Allura Red to enter the body:

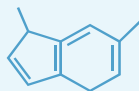
- ❖ Eating or drinking certain foods and beverages
- ❖ Absorbed through skin through some lotions and cosmetics

Names

Name	Place
Allura Red	Canada & Europe
Red.40	United States and Canada
E129	Europe
INS No.129	India
Red 40 Lake	United States
FD&C Red No.40	United States
FD&C Red No.40 Aluminum Lake	United States

What are the Health Effects?

Health Effect	Time (Short-Term or Long-Term)
Attention-Deficit/Hyperactivity Disorder(ADHD) (Behavioural Problems)	Short-Term
Hyperactivity	Short-Term
Allergic Reactions	Short-Term
Hypersensitivity Reactions	Short-Term
Cancer/Colorectal Cancer	Long-Term
Migraines	Short-Term
DNA Damage	Long-Term
Inflammatory Bowel Disease (IBD)	Long-Term



Health Effects

Attention-Deficit/Hyperactivity Disorder (ADHD) in Children

- ❖ Allura Red can worsen symptoms of ADHD in children
- ❖ Allura Red does not cause ADHD
- ❖ Children with ADHD may be sensitive to the dye
- ❖ Kids with ADHD can be associated with behavioural changes and hyperactivity when consuming coloured dyes
- ❖ Research shows that kids with ADHD have improved symptoms when Allura Red is reduced or eliminated from their diet
- ❖ Research suggests that the cause of the behavioral symptoms could be if the child has immune hypersensitivity to the chemicals in Allura Red

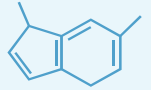
Health Effects

Hyperactivity in Children



- ❖ When children use or consume Allura Red it can impact their behavioral outcomes
- ❖ Allura Red can cause hyperactivity in toddlers
- ❖ Even if the child does not have pre-existing issues it can still cause behavioural problems
- ❖ When children consume Allura Red it can cause allergic reactions like inflammation
- ❖ If a child has an allergic reaction to Allura Red it can lead to neurobehavioural issues
- ❖ Research indicates that the more exposure there is to Allura Red the more hyperactive children act

Hyperactivity Symptoms



Here are some of the hyperactivity symptoms caused by Allura Red:

- ❖ Constant fidgeting
- ❖ The inability to concentrate
- ❖ The inability to sit still
- ❖ Excessive movement
- ❖ The inability to wait
- ❖ Interrupting conversations
- ❖ Little or no sense of danger
- ❖ In adults the symptoms can be restlessness and excessive talking

Health Effects

Allergic and Hypersensitivity Reactions

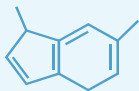
- ❖ If there is a sensitivity to Allura Red an allergic reaction may occur
- ❖ When the body releases the chemical histamine it causes an allergic reaction
- ❖ Allura Red can cause hypersensitivity reactions
- ❖ A hypersensitivity reaction is when your body sees the tiny molecules of Allura Red as a threat launching an attack
- ❖ The attack causes inflammation, neurobehavioral problems and autoimmunity (when the body sees healthy cells as a threat)

Allergy Symptoms

The symptoms range from mild to severe:

- ❖ Headaches
- ❖ Hives & Asthma
- ❖ Skin irritation
- ❖ Sneezing & Watery Eyes
- ❖ Difficulty/Trouble Breathing
- ❖ Face Swelling
- ❖ Dizziness
- ❖ Fainting
- ❖ Low blood pressure





Health Effects

Cancer

- ❖ Allura Red was thought to be a healthier alternative however it was found to have links to cancer
- ❖ One link is that Allura Red contains p-cresidine which is thought to be a cancer causing substance
- ❖ Another link is that it contains traces of benzene a carcinogen
- ❖ Benzene isn't added to Allura Red but a byproduct of the process of production
- ❖ Allura Red isn't thought to be linked to only one specific type of cancer
- ❖ Allura Red may cause colorectal cancer in the colon
- ❖ It is not clear how much exposure of Allura Red it would take to potentially increase the risk of cancer

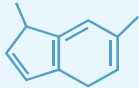


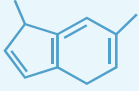
Health Effect

Colorectal Cancer (CRC)



- ❖ One type of cancer that is thought to be caused by Allura Red is colorectal cancer
- ❖ Early Onset Colorectal Cancer (EOCRC) has gone up in the past 40 years
- ❖ Diet effects EOCRC because Allura Red is in high processed foods that people often consume large amounts of
- ❖ An experiment was conducted on mice to see how a western high fat diet plus Allura Red affected the size and weight of the liver, kidney and spleen verses and low fat diet
- ❖ They found that the high fat diet had more weight increase and the Allura Red made it even higher
- ❖ Consuming a high fat western diet with Allura Red can lead to CRC and EOCRC





Health Effects

Migraines

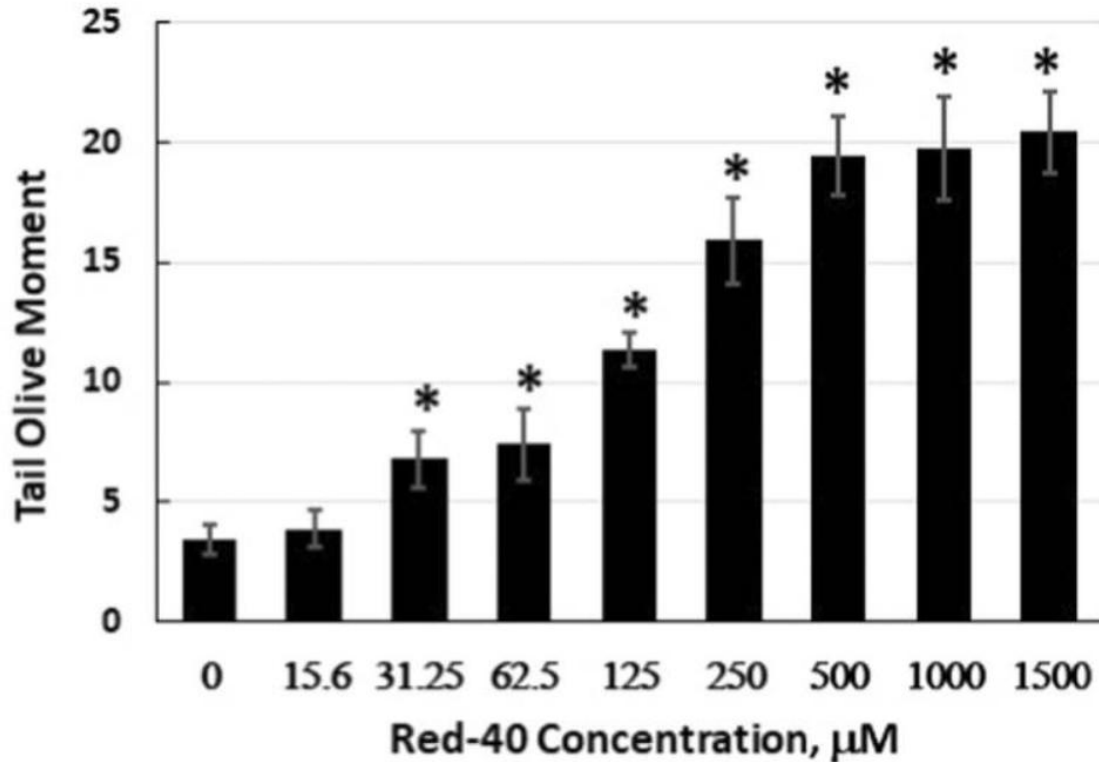
- ❖ Allura Red have been linked to migraines
- ❖ Coloured dyes like Allura Red could be a trigger for migraines for some people
- ❖ People who have a sensitivity or intolerance to coloured dyes may experience migraines
- ❖ It is not yet known why food dyes trigger headaches and migraines



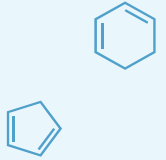
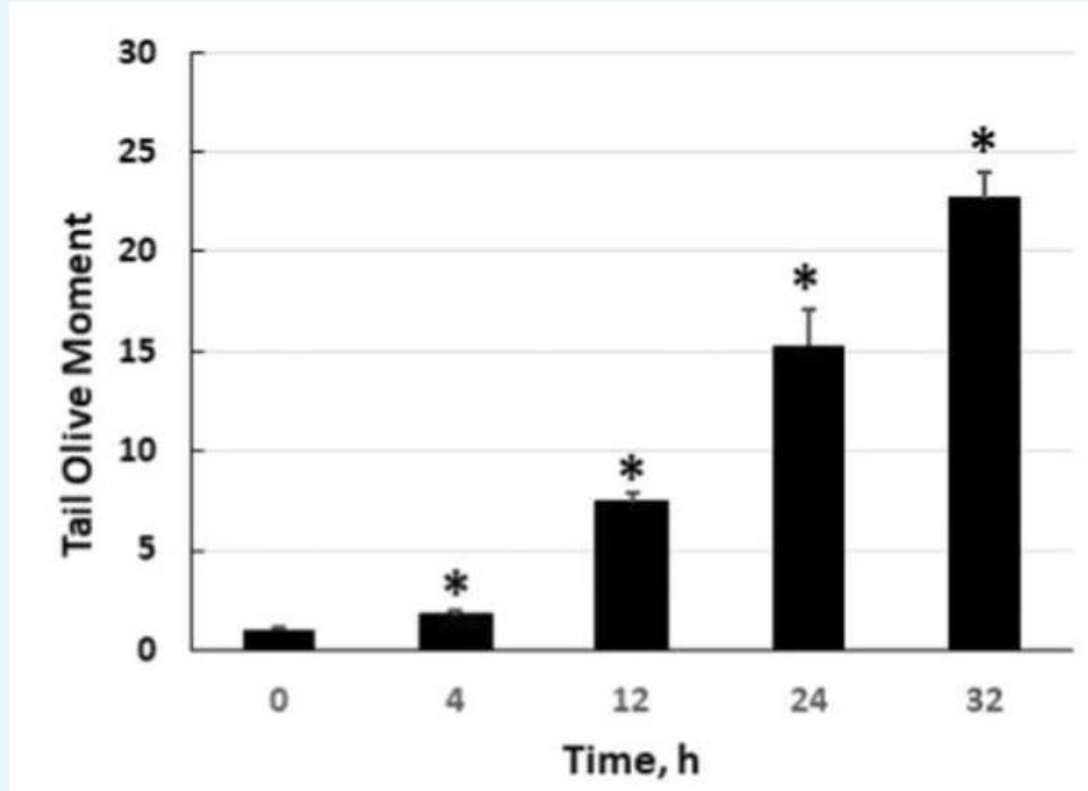
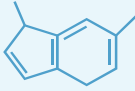
Health Effect DNA Damage

- ❖ The increase of the DNA damage depends on how much Allura Red is used or consumed
- ❖ Allura Red does not significantly stop cell growth
- ❖ An experiment was conducted and it was found that the cell growth for the Allura Red treated cells and the non-treated cells were the same
- ❖ Allura Red can cause DNA damage in the colon
- ❖ An experiment was done on mice where one group was given the Acceptable Daily Intake (ADI) and one was given double the ADI
- ❖ Both groups had DNA damage in the colon the group that was given more Allura Red had more DNA damage

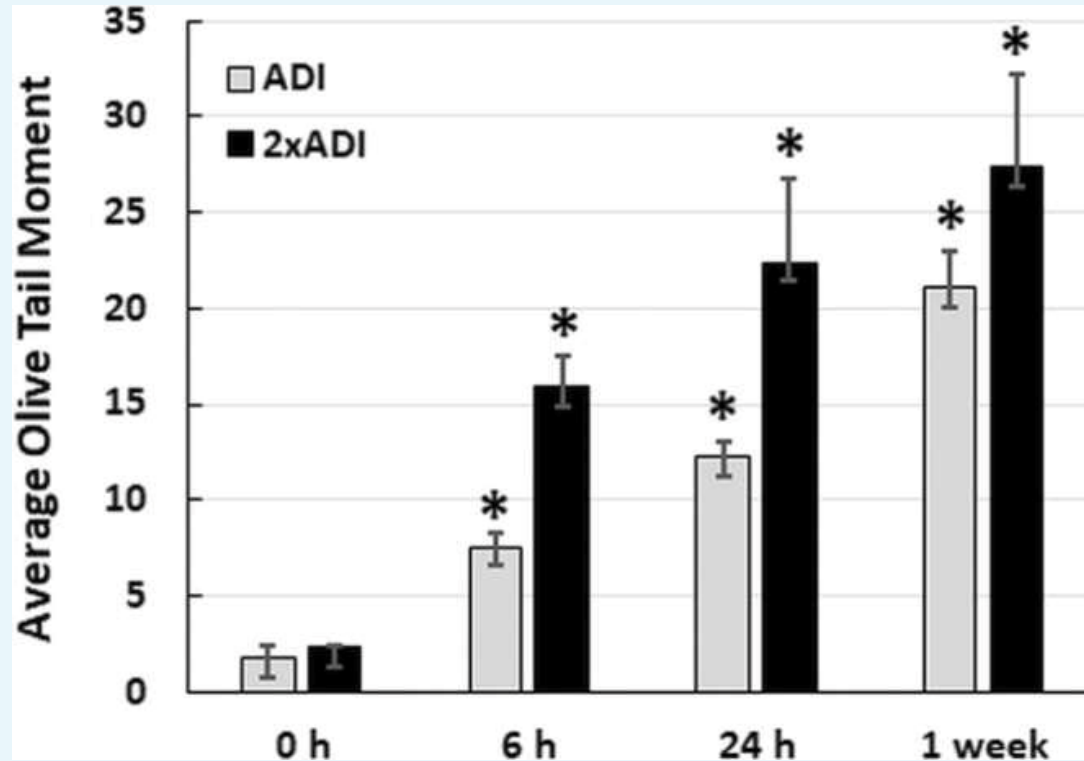
Red.40 Causes DNA Damage In Vitro by Dose



Red.40 DNA Damage In Vitro Over Time



Red.40 DNA Damage In Vivo (Mice)



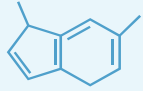
Health Effect

Inflammatory Bowel Disease (IBD)

- ❖ Continuous exposure to Allura Red harms gut health and promotes inflammation
- ❖ Allura Red disrupts the function of the gut barrier
- ❖ Producing a chemical causing the microorganisms of the gut to change, this can increase the likelihood of colitis
- ❖ An experiment was conducted and it was found that mice exposed to Allura Red earlier were more likely to develop colitis
- ❖ Another experiment was conducted with 3 groups of mice, standard diet, daily Allura Red diet, weekly Allura Red diet
- ❖ The findings were that the intermittent Allura Red exposure (similar to human exposure) did not increase the likelihood of colitis
- ❖ They also found that mice that consumed daily Allura Red developed mild colitis

Alternatives

Alternative	Food(s) it can be used in
Beet/Beet Juice	Beverages, Sauces and Desserts
Red radishes	Confectionary and Dairy Products
Purple Sweet Potatoes	Pastries and Desserts
Red Cabbage	Dairy Products
Black Carrots	Fruit Juices and Dairy Products
Maraschino Cherries	Cake Batters and Frosting
Paprika	Meat, Seafood and Soups
Pomegranate Juice	Dressing
Annatto Seeds	Dairy Products
Hibiscus Powder	Tea and Confectionary
Radish and Potato Extracts	Beverages and Dairy Products



Conclusion

Allura Red can be ingested or absorbed into the body which can lead to numerous long-term and short-term health effects especially when consumed excessively. The health effects are both physical and mental. One way to reduce these health effects is by using alternatives. There are multiple names for Allura Red which are important to be aware of. When Allura Red is consumed excessively it can have negative effects. The health effects of Allura Red are ADHD/Behavioural Problems in Children, Hyperactivity in Children, Allergic Reactions, Hypersensitivity Reactions, Cancer/Colorectal Cancer, Migraines, DNA Damage and Inflammatory Bowel Disease (IBD). In conclusion when consumed excessively Allura Red can negatively impact human health.



What's Next

One way that I can continue my research is by investigating other coloured dyes that may affect human health. I could include dyes that are used in products like medicine, cosmetics and personal care products as well. It would be interesting to see how many products coloured dyes are used in and if they have physical and mental health effects.

I could also compare alternatives of Allura Red to see which one is the least detrimental to human health and if it can be a suitable replacement. Determining, what circumstances alternatives can be used in and if they are healthy would be very fascinating.

**Thank You
For Listening!**