

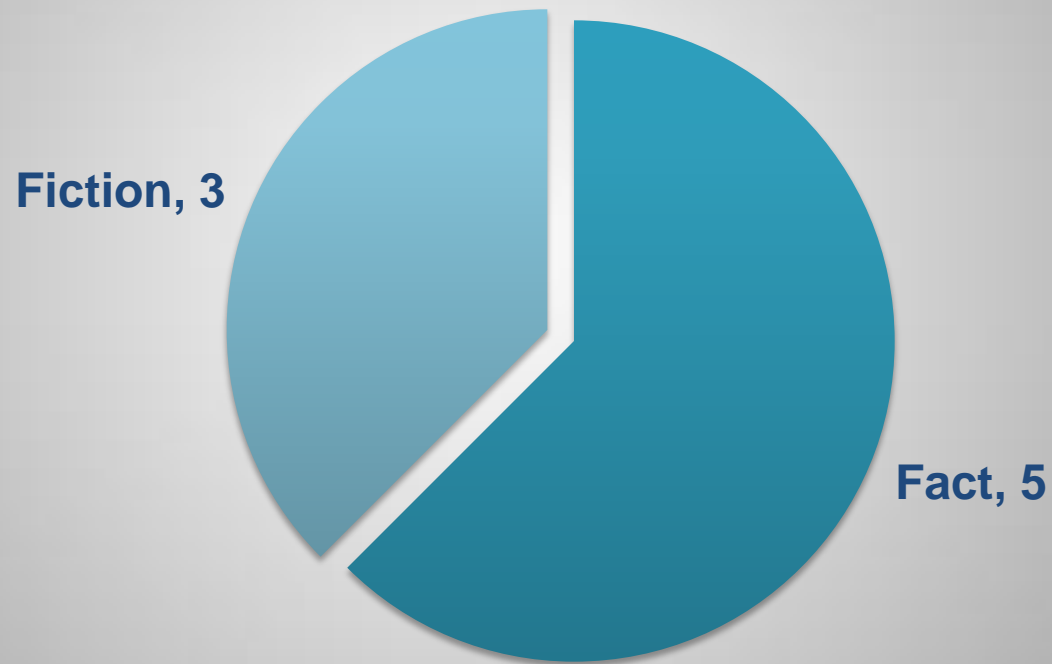
The Effects of Carrot Consumption on Eye Sight in Various Lighting Conditions

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Healthcare Belief

Eating Carrots helps improve overall eyesight, specifically at night.

Initial Group Vote



Hypothesis

Eating carrots improves vision both during the day and at night.



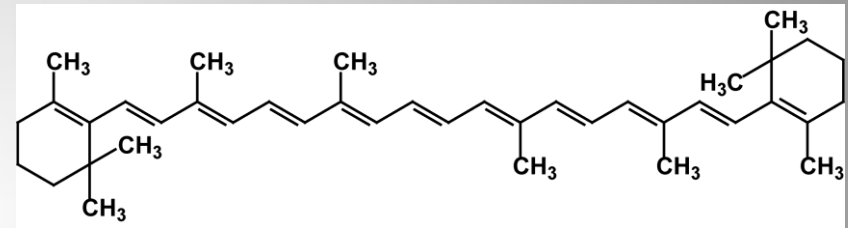
Background: History of the Myth

- Originated during World War II.
 - British Royal Air Force created new radar technology to aid in the detection of German planes.
 - The British lied saying they ate an excessive amount of carrots to improve their eyesight keeping the radar a secret.
- Even the British believed myth
 - British took to eating carrots during blackouts to help improve vision.



Background: Science Behind The Myth

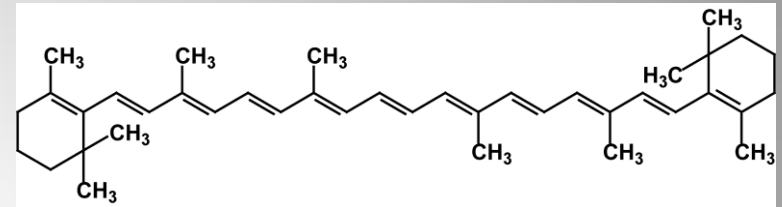
- Carrots have a certain compound called Beta-Carotene
- Beta-Carotene is transformed into Vitamin A by the body (essential in eye health)
- Lutein and zeaxanthin are carotenoid pigments that help build the human retina (also found in carrots)
 - Protect against macular degeneration
 - Improve visual acuity
 - Scavenge harmful oxygen species



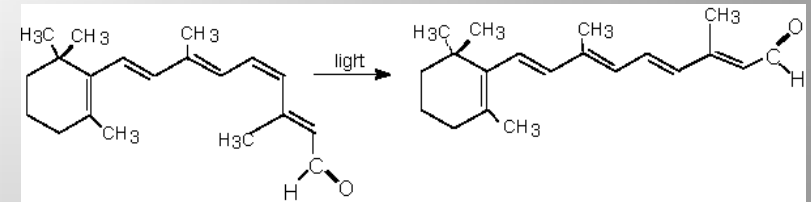
Beta-Carotene

Background: Science Behind The Myth

- Retinal increases the eye's light sensitivity through the rods in the eye
 - Retinal is wrapped tightly by a protein within the rod, and sits in its compacted form called "cis"
 - When light hits the rod, the retinal stretches out into its "trans" form, loosening the protein around it creating Retinol or Vitamin A
 - This signals the brain that it is no longer dark



Beta-Carotene

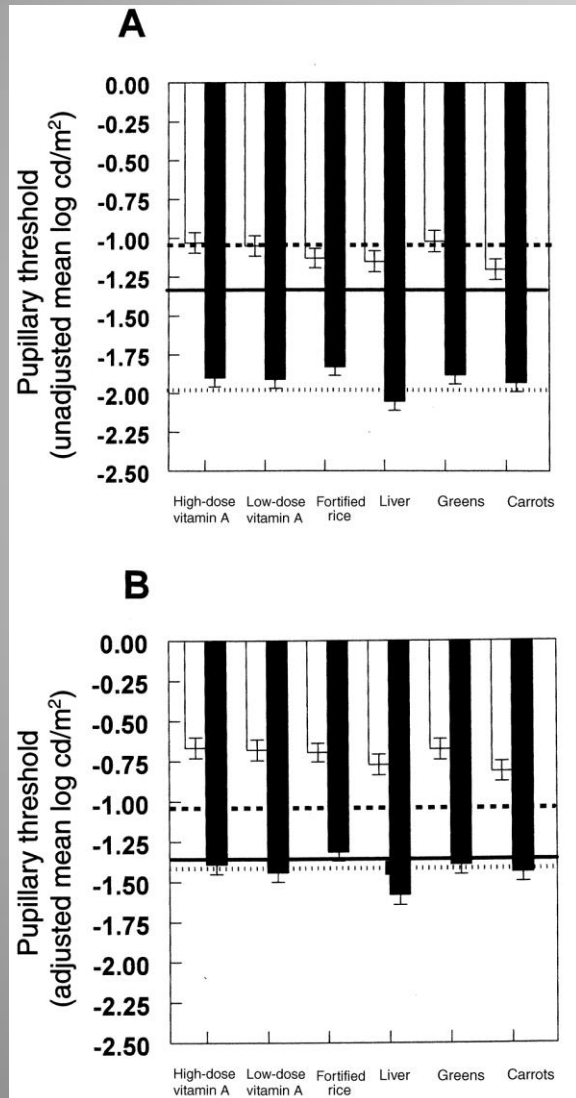


"Cis" form to "trans" form with light

Experiment

- 2005 Study of Nepali women with “night blindness”
- Study divided women into six groups, each eating Vitamin A (retinol) rich substances:
 - **Six Groups:** Fortified Rice, Amaranth Leaf, Goat Liver, Carrots, Small Dose Of Vitamin A (retinyl palmitate) and High Dose Of Vitamin A (retinyl palmitate)
- Carrot group ate 4.5 ounces of cooked carrots for six days each week for 6 weeks

Experiment



- Nepali women started with a pupillary threshold of about -2.00 (on average)
- Nepali women ended with a pupillary threshold of about -1.42 (on average)

Data Analysis

- All women performed roughly the same regardless of Vitamin A source
 - The study shows that a regular diet of cooked carrots did help bring the women's responses to darkness back to normal levels

Experiment

- 2,334 participants aged 55 and older were studied for how they acquired certain carotenoids (α -carotene, β -carotene, β -cryptoxanthin, lutein, zeaxanthin, lycopene, total Vitamin A) based on a semi-quantitative food survey
- The data was then compared with how much of each carotenoid was consumed and whether or not they suffered with various kinds of ophthalmological diseases

Data Analysis

- Data showed that β -carotene was the main contributor to Vitamin A (65%) production
- Vitamin A concentration was negatively-correlated to various eye diseases (including macular degeneration, glaucoma and cataracts)
- The study showed that carrots (including carrot juice and other carrot based products) accounted for majority of α and β -carotene consumption

Conclusion

- Overall, carrots were found to have a beneficial effect on eye sight, specifically night vision (Study 1)
 - However, results included a lot of different foods, not just carrots. Main reason is Vitamin A (Beta-Carotene)
 - Quantity of more than $\frac{1}{2}$ cup per day is a lot for most people
- Additionally, changes found while being statistically significant were not of a huge caliber. Lot of confounding variables (Study 1 and 2)
- In most instances, the quantity of carrots people eat (on average basis) is not going to make a huge impact on vision.

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