

**SUGAR FACTS  
AND MYTHS IN  
NUTRITION  
UNDER THE  
GUIDANCE OF  
SCIENCE**

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World Sugar Research Organisation



# World Sugar Research Organisation

## Researching the effects of sugar on nutrition & health

WSRO is a global Members bases organisation, providing objective and relevant scientific information, on sugar's role in health and nutrition.

WSRO supports research addressing knowledge gaps, and provides perspective on the body of evidence on sugar and health to Member and Public Health stakeholders.



# SCIENCE PROGRAMME

WSRO provides evidence based information on the nutrition and health science around sugar to its Members and stakeholders.

KNOWLEDGE PROGRAMME

RESEARCH PROGRAMME



# The Sugar Landscape



World Health  
Organization

**Consensus and Guidelines** across the globe recommending limiting sugars consumption



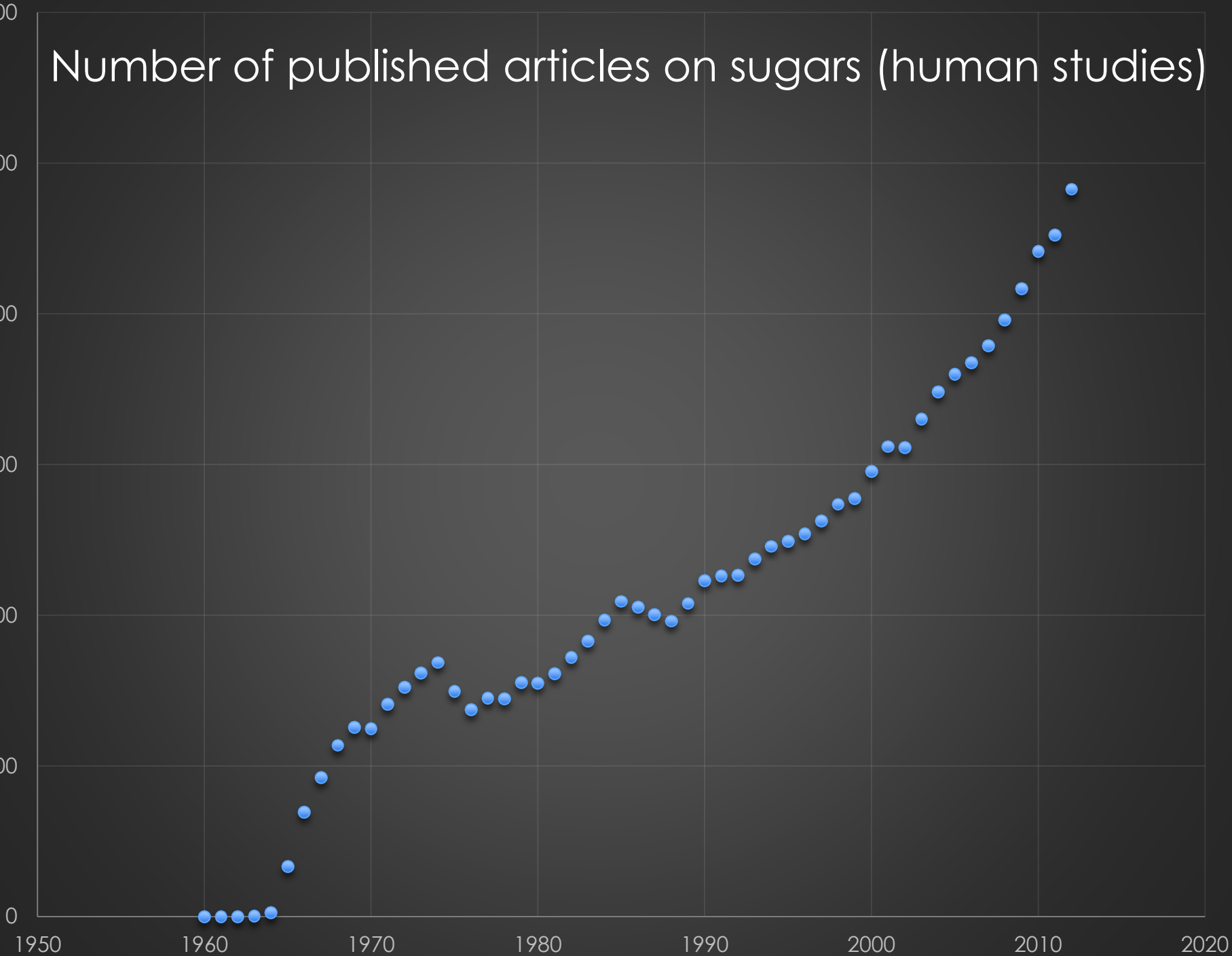
Sugary drinks are viewed as a threat worth **regulating**



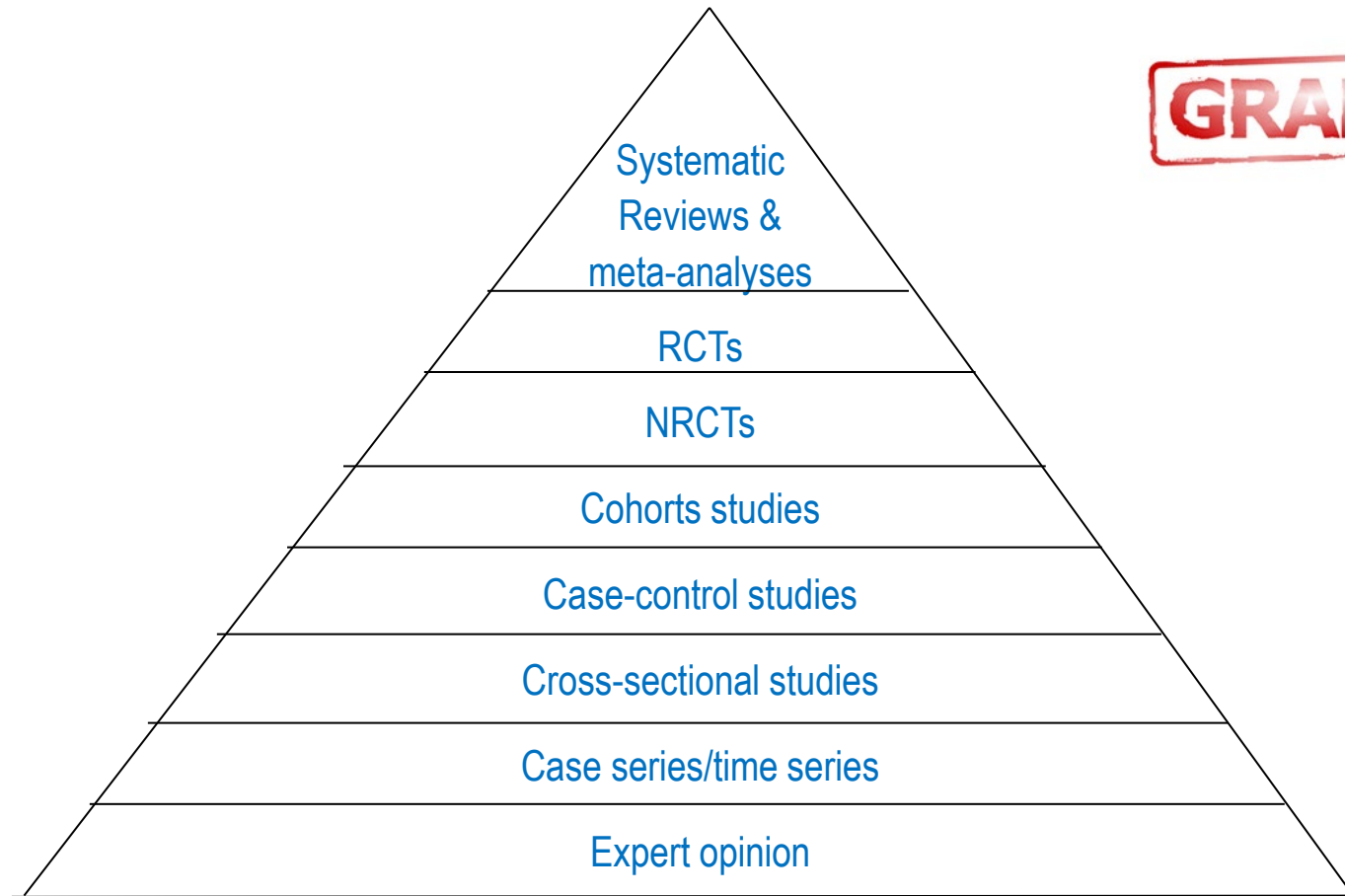
Industry **reformulation** strategies to meet public health drive



# Number of published articles on sugars (human studies)



# Hierarchy of Evidence



**GRADE**

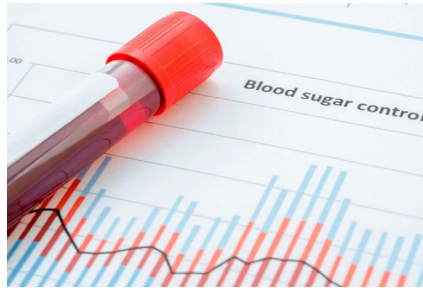
Health Outcome	Effect/Association	Evidence
Energy Intake	Yes	Adequate
CVD Biomarkers	No	Limited
Coronary Events	No	Moderate
Type 2 Diabetes (T2D)	No	Limited
T2D Biomarkers	No	Limited
SSB and T2D	Yes	Moderate
SSB Body Fat/BMI	Yes	Limited
Sugars and Dental Caries (DC)	Yes	Moderate
SSB and DC	Yes	Adequate
SCF and DC	Yes	Limited



# Sugar and Health



Energy intake



Metabolism



Food & Drink





*"Does Sugar makes you fat?"*

## 4 Ways Sugar Can Make You Fat

**There's growing evidence that eating fat won't make you fat, but sugar will**

Erin Brodwin Jul. 20, 2018, 9:00 AM



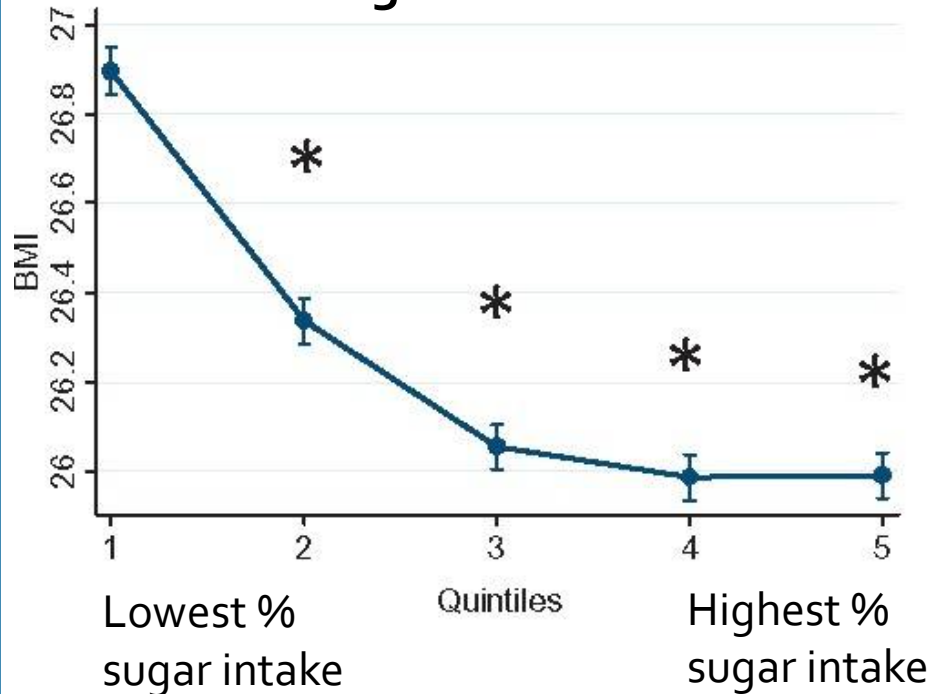
HEALTH

July 19, 2018 4:05 pm

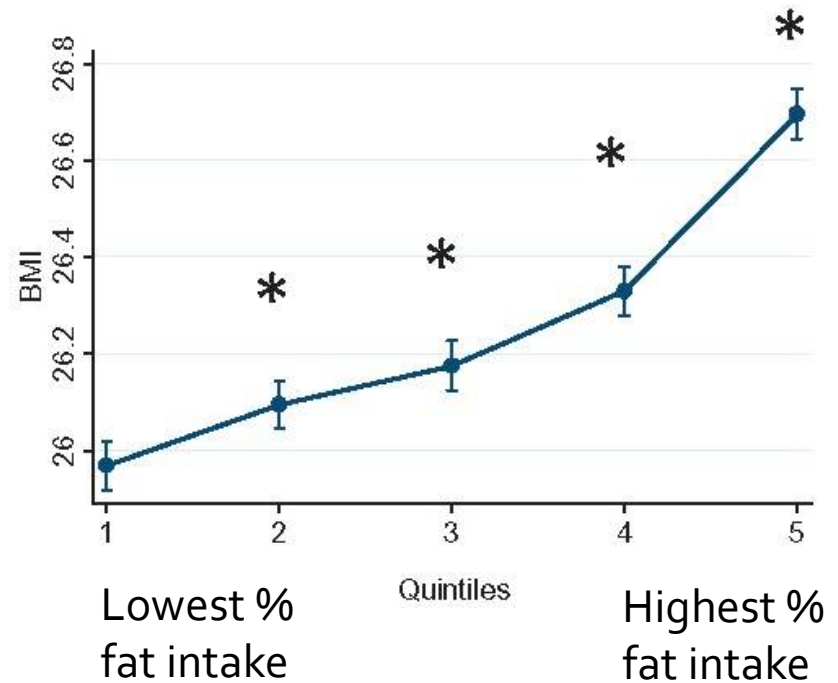
**Fruit is full of natural sugar — but is it making you gain weight?**

# Fat & Sugars Intake and Adiposity

## Sugars intake



## Fat intake

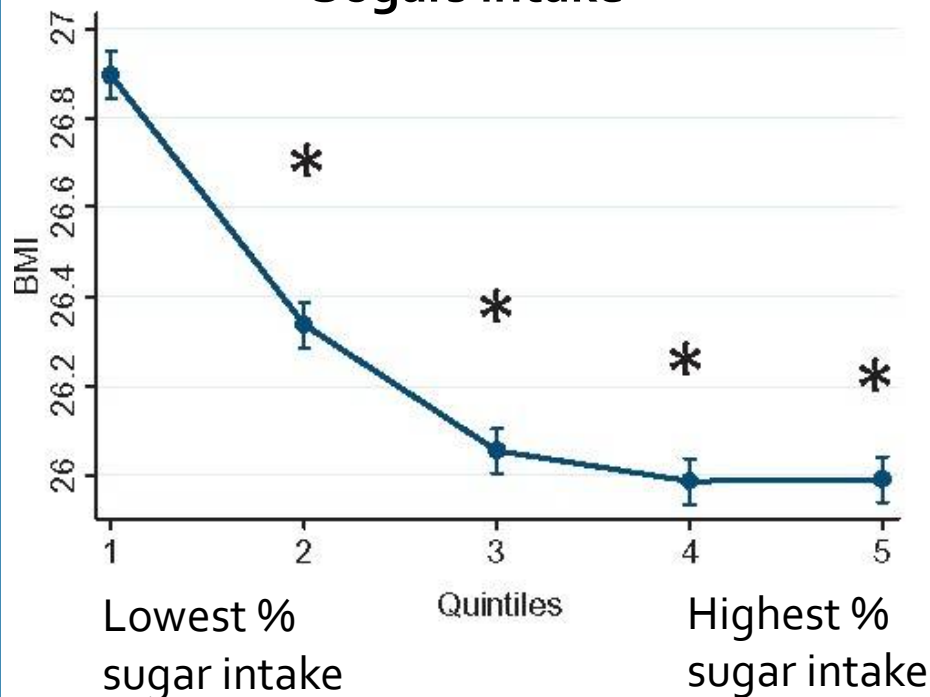


**Those with the highest BMIs consume the highest amounts of fat and lowest amounts of sugar as a proportion of energy intake**

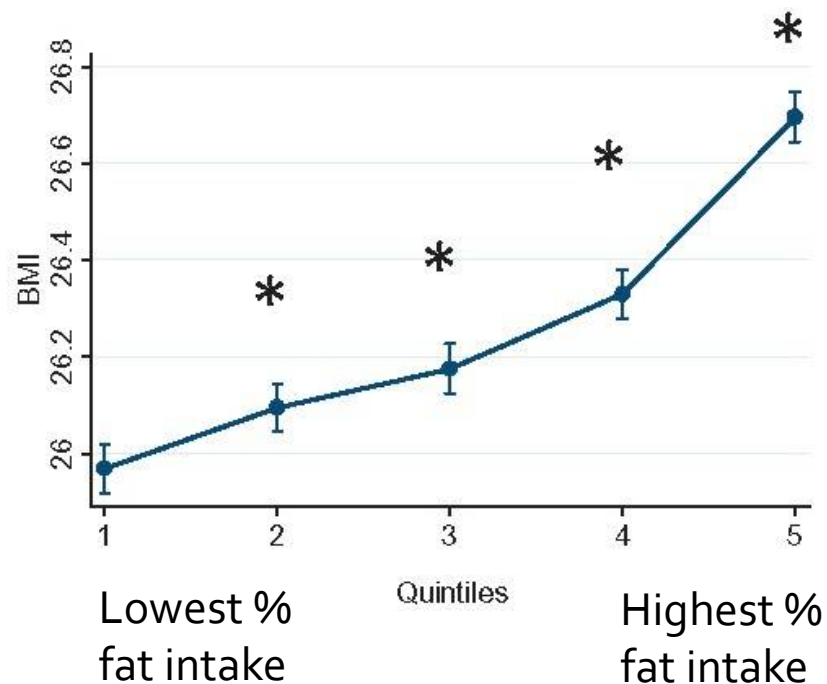


# Fat & Sugars Intake and Adiposity

## Sugars intake



## Fat intake

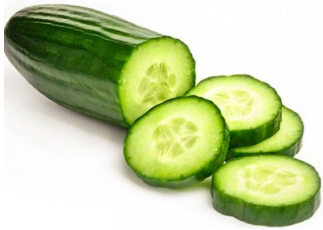


**Narrowly focusing on sugar intake may detract from the need to reduce total calorie intake**



# Energy Density of Food

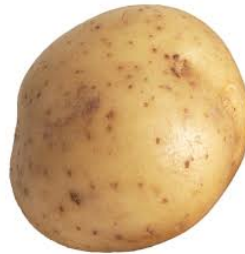
Calories per 100g of food



15 kcal



89 kcal



93 kcal



130 kcal



252 kcal



454kcal



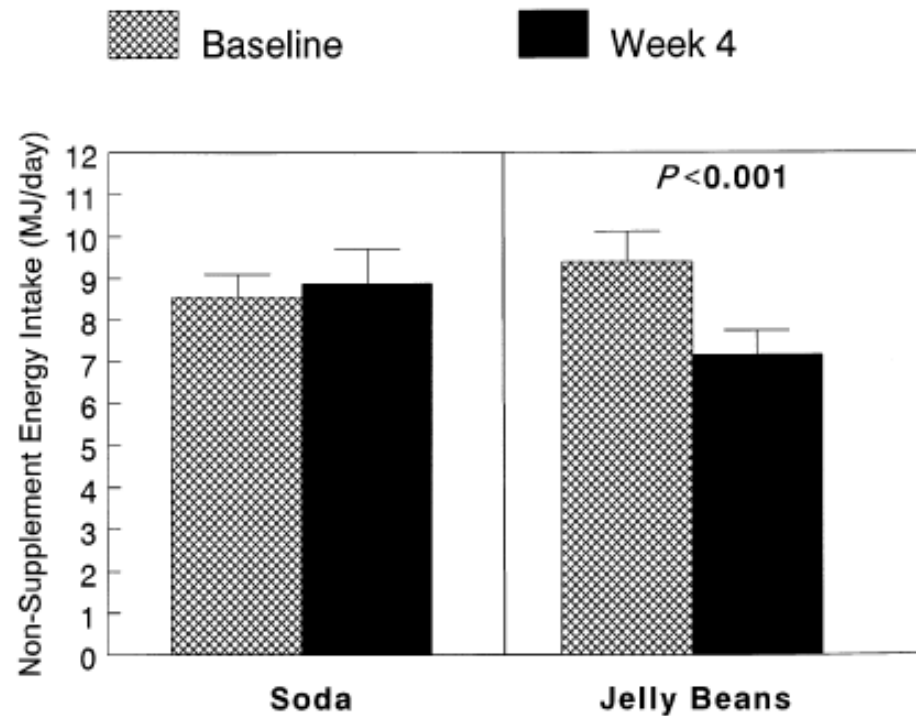
450 calories per day of soft drinks or  
450 calories per day of jelly beans  
given for 4 weeks in addition to  
normal diet



**What happens to calorie intake in the rest of the diet?**



# Effects of additional liquid and solid calories on energy intake



*"Fructose is the worse type of sugar"*

**Mail**Online

## **Syrup found in biscuits, ice cream and energy drinks fuelling diabetes on a 'global scale'**

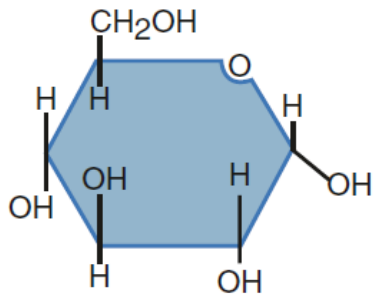
- **Countries that use large amounts of fructose corn syrup have diabetes rates 20% higher than those that consume little**
- **U.S has greatest consumption of the syrup by far amounting to 25kg per person a year, compared to 0.5kg in the UK**

**The  
Economist**

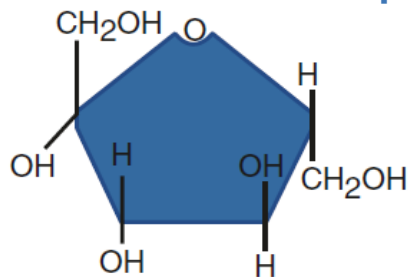
## **How too much fructose may cause liver damage**



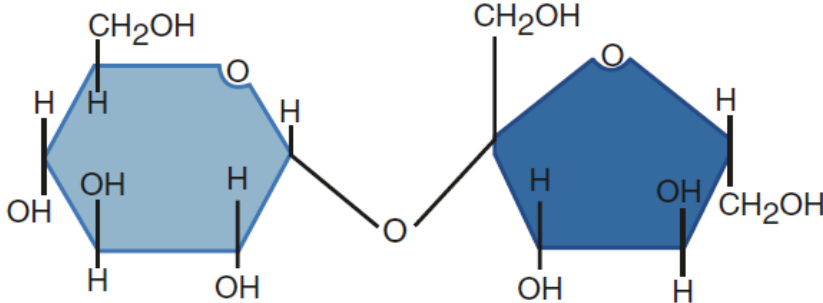
HFSC, Honey, Fruit Juice Concentrates



Glucose  
( $\alpha$ -D-glucopyranose)



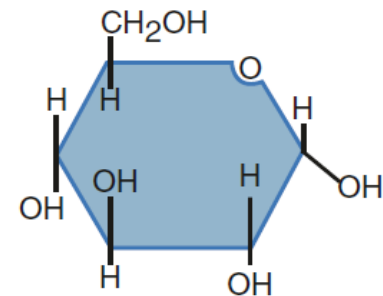
Fructose  
( $\alpha$ -D-fructofuranose)



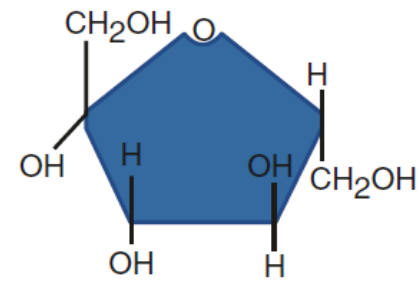
Sucrose  
(*O*- $\alpha$ -D-glucopyranosyl- (1 $\rightarrow$ 2)- $\beta$ -D-fructofuranoside)

Sugar

Portal Blood  
monosaccharides



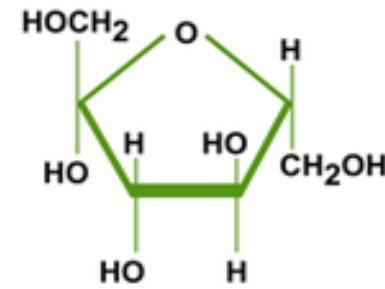
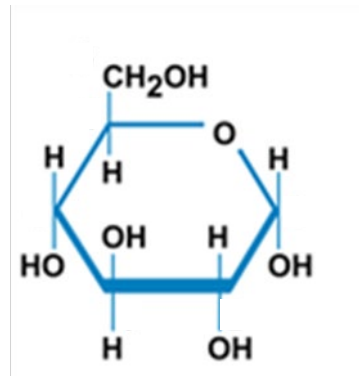
Glucose



Fructose



# Glucose Vs Fructose



Characteristic	Glucose	Fructose
Saccharide	Monosaccharide	Monosaccharide
Molecular formula	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>
Calories	4 kcals/g	4 kcals/g
Structure	6-member ring	5-member ring
Glycaemic Index	High (100)	Low (19)
Sweetness*	0.74	1.74

\*sucrose = 1



# METABOLISM

Intestines

Fructose

Epithelial cell

GLUT5

ChREBP

GLUT5?

Via portal circulation

FGF21

LPL

APOC3/  
ANGPTL8

Hypertriglyceridemia/  
VLDL accumulation

↑ Glucose  
production

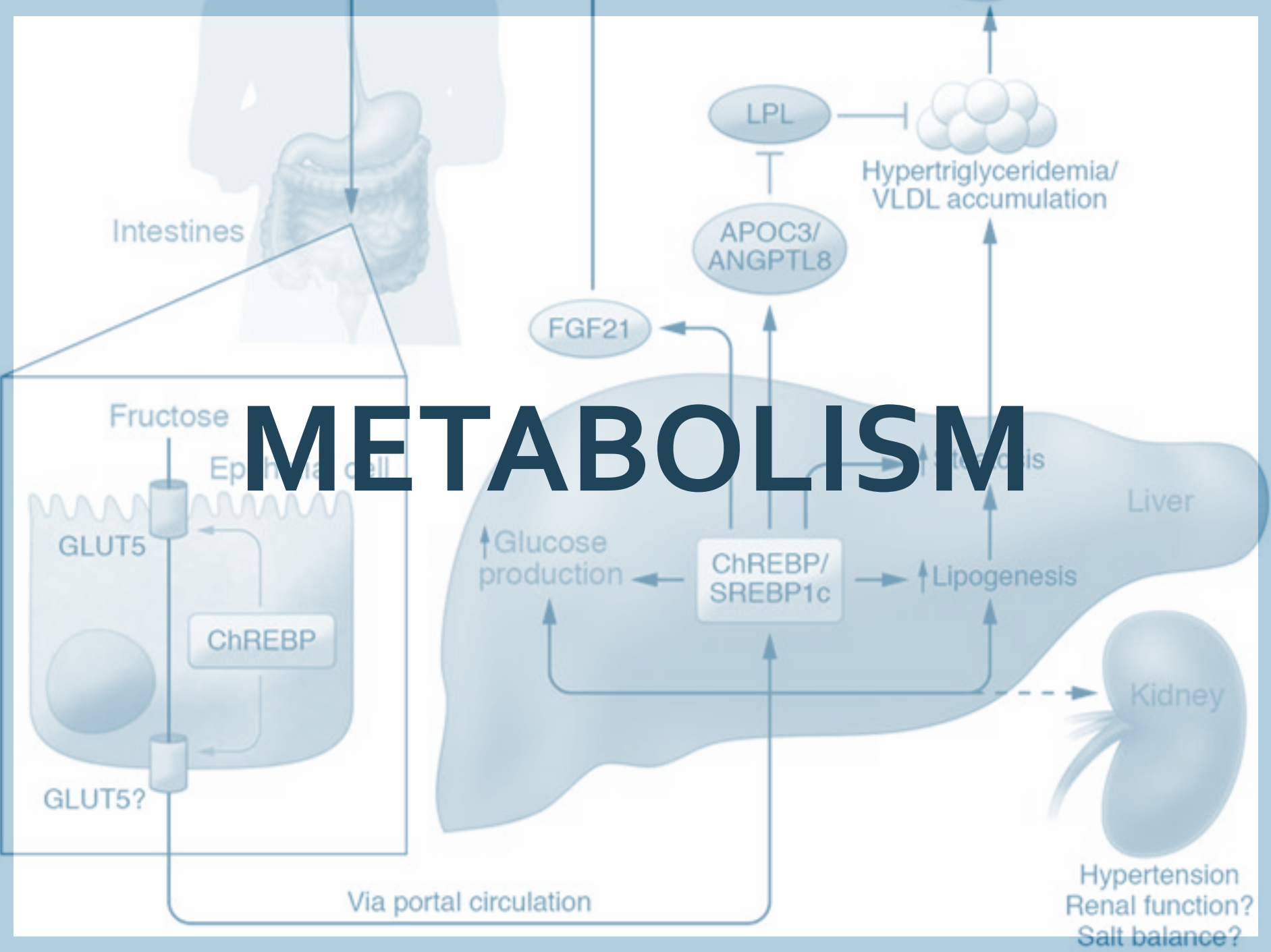
ChREBP/  
SREBP1c

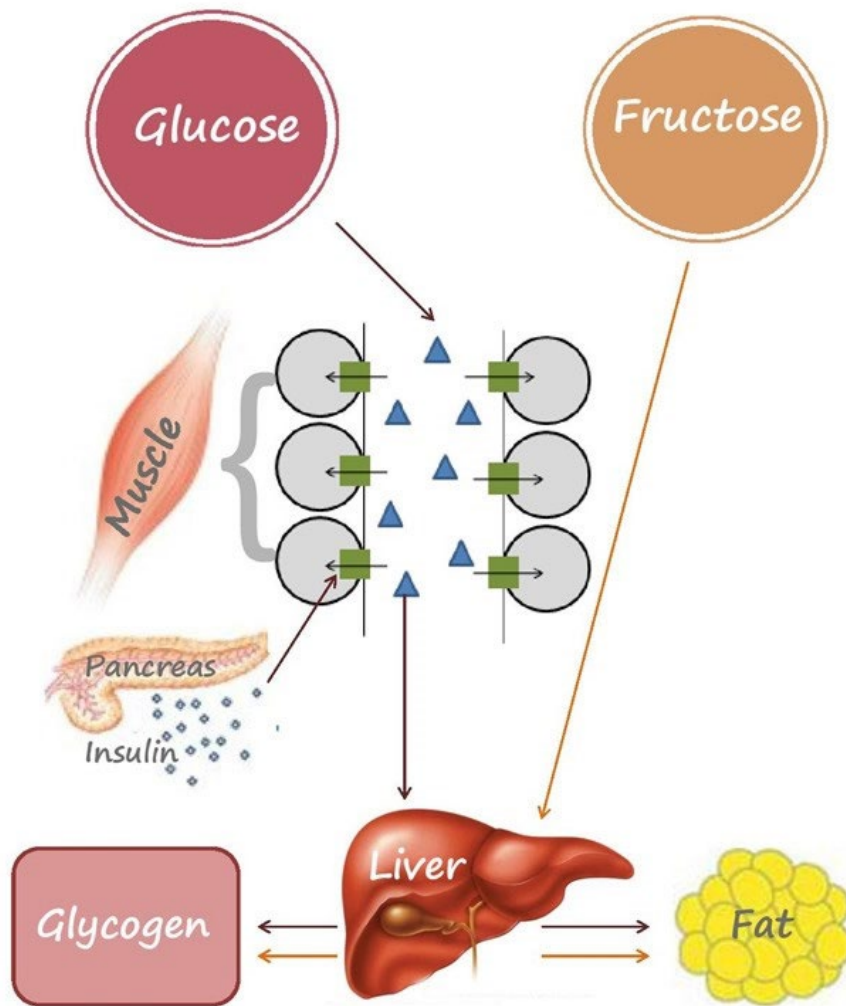
↑ Lipogenesis

Liver

Kidney

Hypertension  
Renal function?  
Salt balance?





## METABOLISM

Consumed in excess they may have different implications

**Glucose** stimulates the pancreas to release insulin, which then triggers uptake by cells in the body (e.g. muscle cells) causing blood glucose to return to base levels. Excess consumption can lead to insulin resistance.

**Fructose**, is metabolized in the liver to glucose or fat. Consumed in excess, may lead to fatty liver deposit.



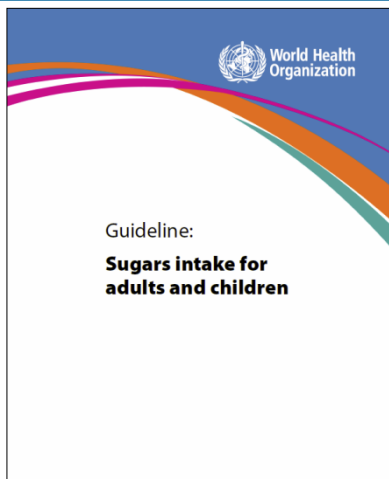
# What the Authorities Say

*"We are not aware of any evidence, that there is a difference in safety between foods containing HFCS 42 or HFCS 55 and foods containing similar amounts of other nutritive sweeteners with approximately equal glucose and fructose content, such as sucrose, honey, or other traditional sweeteners." Food & Drug Administration (FDA), 2018*



*EFSA will provide scientific evidence on the daily intake of added sugar in food by early 2020. The Authority aims to establish a science based cut-off value for daily exposure to added sugars from all sources which is not associated with adverse health effects. European Food Safety Authority (EFSA), 2017*



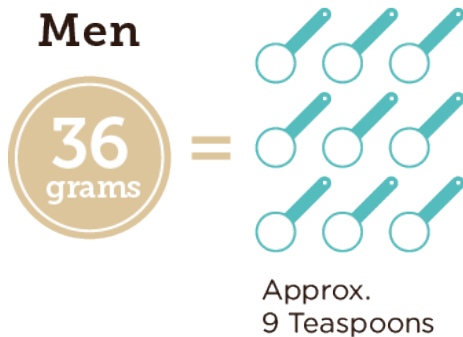


# WHO Guideline on Sugars – *the recommendations*

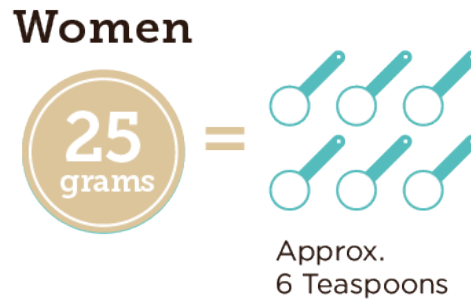
1. Reduced intake of 'free sugars' throughout the life-course
  - [*strong recommendation*]
  
2. In both adults and children, WHO recommends that intake of 'free sugars' not exceed 10% of total energy
  - [*strong recommendation*]
  
1. WHO suggests further reduction to below 5% of total energy
  - [*conditional recommendation*]

# Sugar Intake Guidelines

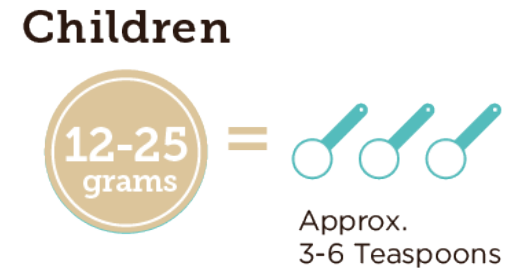
The **World Health Organisation** suggests consuming no more than 5% of our daily calories from added sugars



150 calories



100 calories



# Sugar sweetened beverage tax

- Appendix 3 – selection of policy options and cost-effective interventions to tackle NCDs
- “Reduce sugar consumption through taxation of sugar-sweetened beverages”

“0.74 kg weight reduction per serving of SSB per day”

Pooled result using two papers\* from a systematic review by Te Morenga *et al* (2012)  
French *et al.* (1994) prospective study in America  
Stoof *et al.* (2011) prospective study in Amsterdam with 238 participants

## GLOBAL ACTION PLAN

FOR THE PREVENTION AND CONTROL OF NONCOMMUNICABLE DISEASES

2013-2020





## Find a Balance that Works for You

America's beverage companies—Coca-Cola, Dr Pepper and Pepsi—have come together to support your family's efforts to balance what you eat, drink and do. We know an important part of finding that balance is reducing the sugar from beverages in your family's diet. So we're backing you up with ways to make it easier. Learn more about what we're doing through our **industry efforts**, **beverage choices** and **community support**.

### INDUSTRY EFFORTS

#### Cutting Sugar in the American Diet

Check out how the beverage industry's Balance Calories Initiative is working to reduce beverage calories per person an additional 20% by 2025.

### BEVERAGE CHOICES

#### Introducing More Choices

Explore a wider range of products with less sugar or no sugar at all from Coca-Cola, Dr Pepper and Pepsi.

### COMMUNITY SUPPORT

#### Making Our Communities Stronger

See how we're creating jobs, working with local partners and giving back to our communities—because we live and work here, too.

### INDUSTRY EFFORTS

#### Putting Calorie Info Up Front

Learn how we're making it easier to find the beverage that's right for you.

### INDUSTRY EFFORTS

#### Removing Calories from Schools

See the results of our voluntary efforts to remove full-calorie soft drinks from schools.

### TWITTER

Start your year off right with more choices, smaller portions, and options with less sugar or no sugar at all for y... [twitter.com/i/web/...](https://twitter.com/i/web/...)

@Balance US  
January 22, 2018 8:29 pm



# KitKat changes recipe for the first time in decades

3m

No. Kit Kats produced in York everyday

7,500

Reduction in the No. tonnes of sugar Nestlé will use in its products by next year

Nestlé said it would use around 7,500 tonnes less sugar to make its products by next year.

The sugar will be replaced with higher quantities of other existing ingredients or other, non-artificial ingredients.

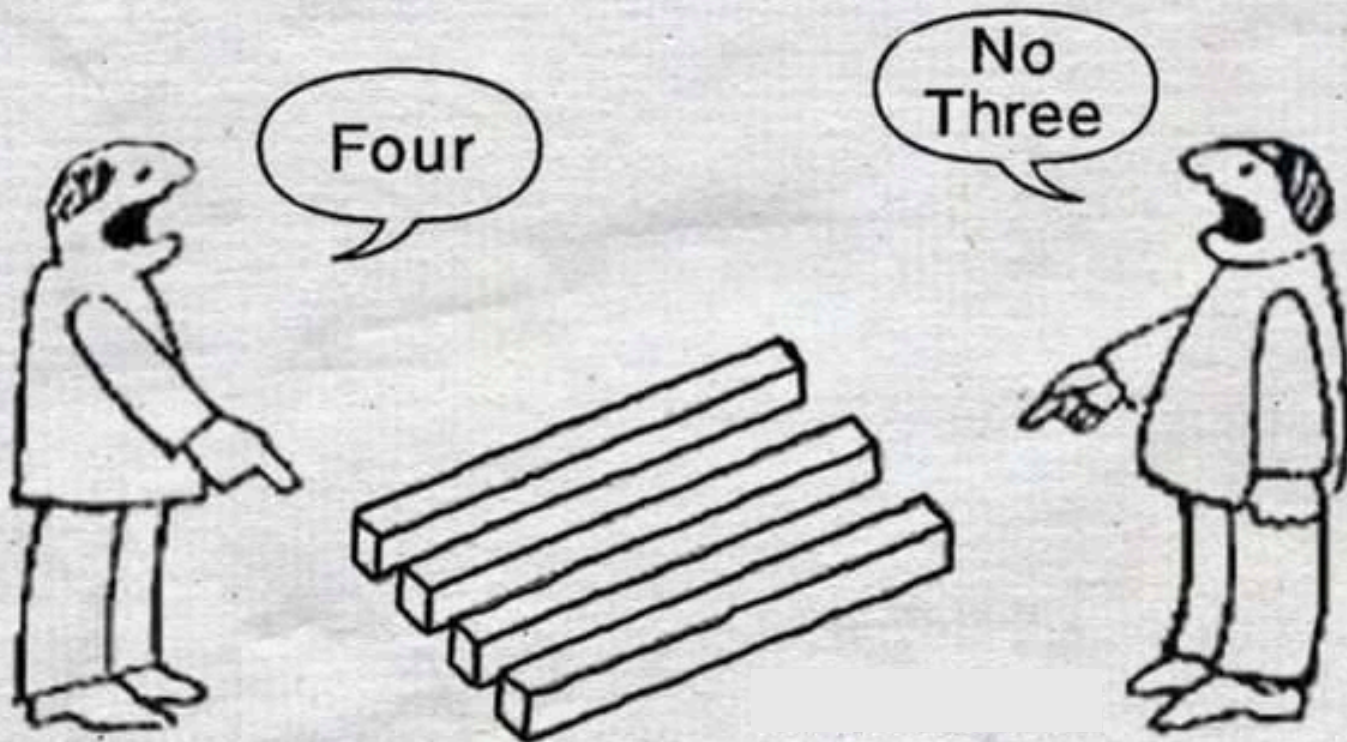


**New 'healthier' KitKat only contains four fewer calories than previous recipe**



**"Everything we hear  
is an opinion, not a fact.  
Everything we see  
is a perspective, not the truth."**

- Marcus Aurelius



THANK  
YOU

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