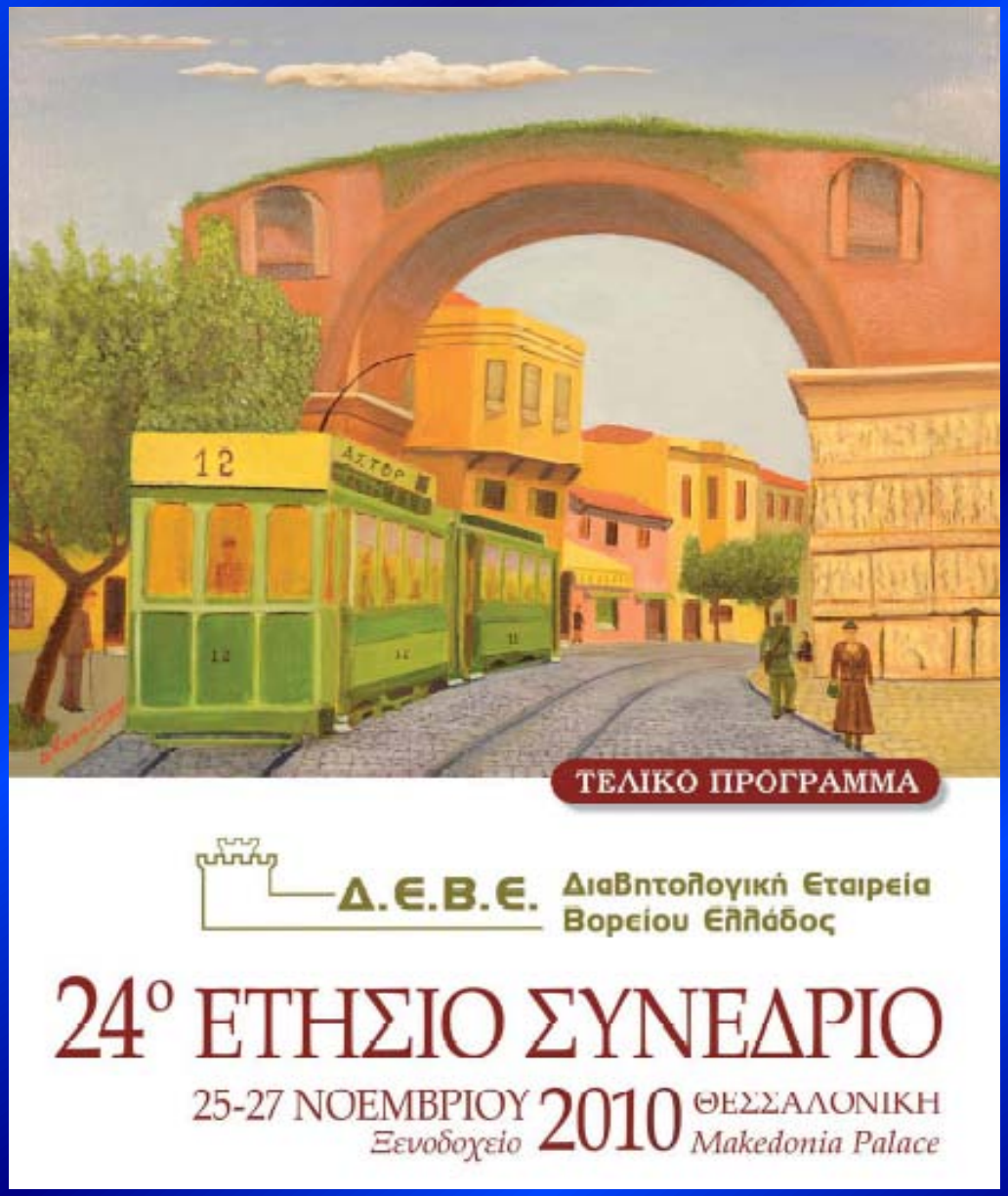
Ο ρόλος της φρουκτόζης στη διατροφή του ατόμου με ΣΔ



Β. Λιμενόπουλος

Φρουκτόζη και Διαβήτης. Κλασικές απόψεις.

Πλεονεκτήματα της φρουκτόζης έναντι της ζάχαρης

- Μεγαλύτερη γλυκαντική ισχύς από την κοινή ζάχαρη και χαμηλότερος γλυκαιμικός δείκτης
- Με μικρότερη ποσότητα, άρα πρόσληψη λιγότερων θερμίδων, τα ίδιο γλυκαντικό αποτέλεσμα
- Επί ίσης ποσότητας πρόσληψης με τη κοινή ζάχαρη μικρότερες υπεργλυκαιμικές αιχμές και μικρότερα επίπεδα μεταγευματικής ινσουλιναιμίας

Μειονεκτήματα-επιφυλάξεις

- Επί μεγάλης ποσότητας πρόσληψης, πρόκληση δυσλιπιδαιμίας.

Diabetes Care

Fructose

Dietary fructose produces a smaller rise in plasma glucose than isocaloric amounts of sucrose and most starchy carbohydrates. In that regard, fructose may offer an advantage as a sweetening agent in the diabetic diet. However, because of potential adverse effects of large amounts of fructose (i.e., double the usual intake [20% of calories]) on serum cholesterol and LDL cholesterol, fructose may have no overall advantage as a sweetening agent in the diabetic diet. Although people with dyslipidemia should avoid consuming large amounts of fructose, there is no reason to recommend that people avoid consumption of fruits and vegetables, in which fructose occurs naturally, or moderate consumption of fructose-sweetened foods

Volume 20 Supplement 1
American Diabetes Association: Clinical Practice Recommendations 1997

Evidence-Based Nutrition Principles and Recommendations for the Treatment and Prevention of Diabetes and Related Complications

In several studies in diabetic subjects, fructose produced a reduction in postprandial glycemia when it replaced sucrose or starch as a carbohydrate source (69,106,136,137). Thus fructose might be a good sweetening agent in the diabetic diet. However, this potential benefit is tempered by the concern that fructose may have adverse effects on plasma lipids. Consumption of large amounts of fructose (15–20% of daily energy intake [90th percentile of usual intake]) has been shown to increase fasting total and LDL cholesterol in subjects with diabetes (137) and fasting total and LDL cholesterol and triglycerides in nondiabetic subjects (138,139,140,141).

Diabetes Care January 2002 vol 25 no. 1 148-98

Nutrition Principles and Recommendations in Diabetes

American Diabetes Association

In subjects with diabetes, fructose produces a lower postprandial response when it replaces sucrose or starch in the diet; however, this benefit is tempered by concern that fructose may adversely effect plasma lipids. Therefore, the use of added fructose as a sweetening agent is not recommended; however, there is no reason to recommend that people with diabetes avoid naturally occurring fructose in fruits, vegetables, and other foods.

Diabetes Care January 2004 vol. 27 no. suppl 1

Nutrition Recommendations and Interventions for Diabetes–2006
A position statement of the American Diabetes Association
American Diabetes Association

In individuals with diabetes, fructose produces a lower postprandial glucose response when it replaces sucrose or starch in the diet; however, this benefit is tempered by concern that fructose may adversely affect plasma lipids (1). Therefore, the use of added fructose as a sweetening agent in the diabetic diet is not recommended. There is, however, no reason to recommend that people with diabetes avoid naturally occurring fructose in fruits, vegetables, and other foods. Fructose from these sources usually accounts for only 3–4% of energy intake.

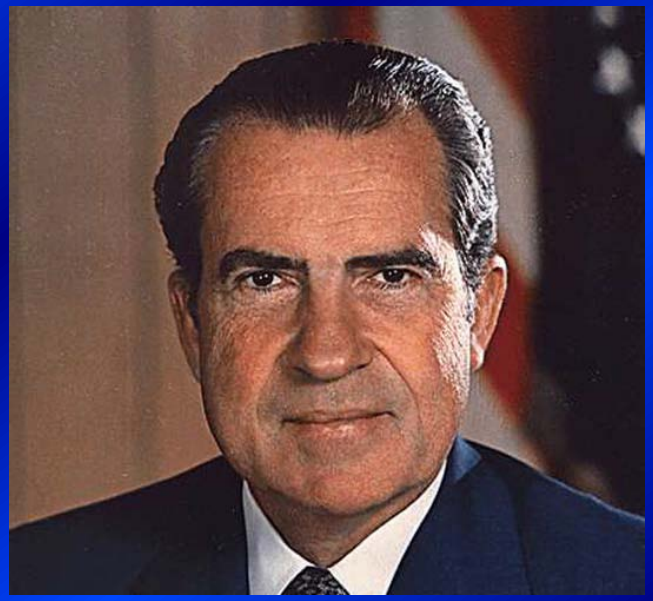
Diabetes Care September 2006 vol. 29 no. 9 2140-2157

Nutrition Recommendations and Interventions for Diabetes
A position statement of the American Diabetes Association
American Diabetes Association

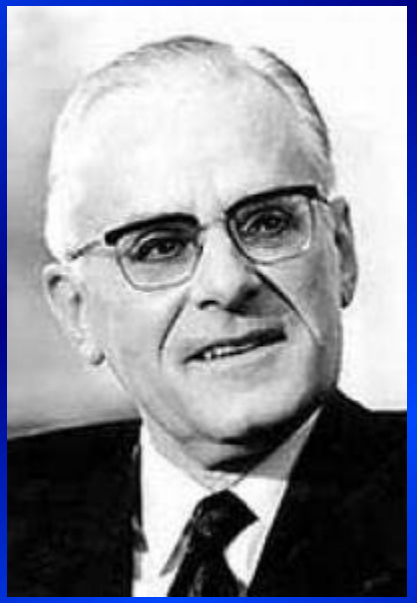
In individuals with diabetes, fructose produces a lower postprandial glucose response when it replaces sucrose or starch in the diet; however, this benefit is tempered by concern that fructose may adversely affect plasma lipids (1). **Therefore, the use of added fructose as a sweetening agent in the diabetic diet is not recommended**. There is, however, no reason to recommend that people with diabetes avoid naturally occurring fructose in fruits, vegetables, and other foods. Fructose from these sources usually accounts for only 3–4% of energy intake.

Diabetes Care January 2008 Vol 31 no. Suppl 1 S61-S78

Ο ρόλος της φρουκτόζης στη διατροφή του ατόμου με ΣΔ



Richard Nixon (1913-1994).The 37th President of the United Stages from 1969 to 1974

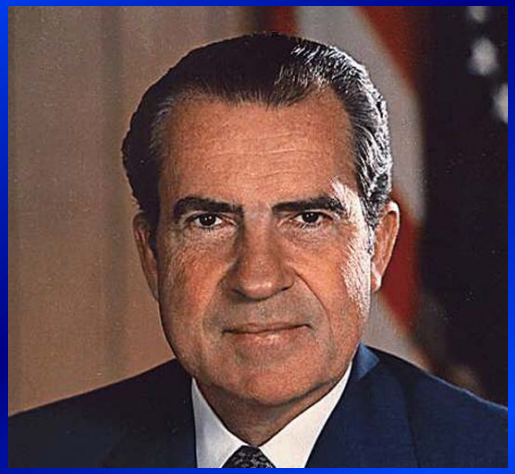


Earl Butz (1909- 2008).Secretary of agriculture under President Richard Nixon.

Λιμενόπουλος Βασίλειος. Παθολόγος-Διαβητολόγος Διευθυντής ΕΣΥ.

24 ΕΤΗΣΙΟ ΣΥΝΕΔΡΙΟ Δ.Ε.Β.Ε, ΜΑΚΕΔΟΝΙΑ PALACE 26 ΝΟΕΜΒΡΙΟΥ 2010

Is corn making us fat? Michael Pollan argues that U.S. farm policy promoting overproduction of corn has made America overweight and made big food companies very happy
New York Times Upfront, Dec 8, 2003 by Michael Pollan



President Richard M. Nixon's 1972 deal to sell American grain to the Soviet Union coincided with bad weather in the farm belt. The grain deal and the bad weather together caused agricultural prices to soar, and before long so did supermarket prices for meat, milk, bread and other staple foods lied to the cost of grain. With angry consumers protesting food prices, Nixon ordered his Secretary of Agriculture, Earl Butz, to do whatever was necessary to drive down the price of food.

Nixon's Secretary of Agriculture, Earl Butz is a key figure in the emergence of corn as King.

Review: King Corn- You Are What You Eat

Blame Earl Butz. Richard Nixon and Gerald Ford's Secretary of Agriculture brought in the Farm Bill that dramatically increased the amount of corn produced in America. He encouraged farmers to "get big or get out," and to plant crops like corn "from fence row to fence row." Further billions in subsidies to farmers encouraged production, and soon America was awash in cheap grain, and with it cheap meat. Food costs as a portion of the American diet dropped to the lowest level in history; we became corn. Michael Pollan writes: "If you eat industrially, you are made of corn. It holds together your McNuggets, it sweetens your soda pop, it fattens your meat, it is everywhere. It is fed to us in many forms, because it is cheap- a dollar buys you 875 calories in soda pop but only 170 in fruit juice. A McDonalds meal was analyzed as almost entirely corn."

The Fructose Wars - Fat is No Longer a Choice
By Ray Savant

It all began about thirty years ago.

Three things happened around the same time and the combination opened a window for corporate America to profit. A window they dived right into.

1. Richard Nixon encouraged the food industry to keep prices as low as possible so rising food prices wouldn't be an issue in the reelection.
2. High Fructose Corn Syrup aka HFCS was invented in Japan and then brought over to the USA in 1975. HFCS is half the price of sugar and twice as sweet so they replaced all natural sugar with it.
3. The USDA and AHA in 1982 told us to reduce our fat consumption to stop heart disease, thus starting the Fat Free Craze. With no fat to give food taste the food industry turned to High Fructose Corn Syrup and put it in everything.

The Fructose Wars - Fat is No Longer a Choice
By Ray Savant

Besides soft drinks, High Fructose Corn Syrup is also now found in

- cereals
- salad dressings
- cheese spreads
- yogurt
- jam
- peanut butter
- crackers
- ketchup
- ice cream
- bread

Everything you need to know about fast food.

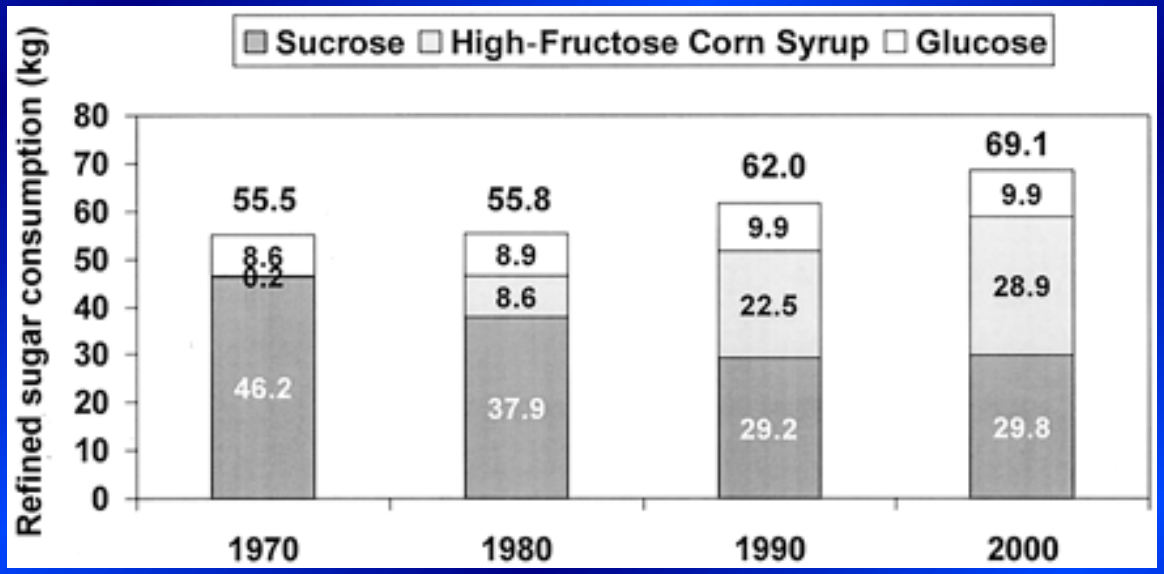
Author: Leo

Από το 1970 μέχρι σήμερα οι αγρότες παράγουν 500 επιπλέον θερμίδες ανά άτομο. Οι φτηνές τιμές πρώτων υλών για τρόφιμα θα έπρεπε να οδηγήσουν σε μείωση των τιμών των αναψυκτικών και των προσφερόμενων έτοιμων φαγητών, γεγονός που δεν συνέβη αφού αυξήθηκαν τόσο οι προσφερόμενες μερίδες όπως στα Mc Donald's π.χ. που από 600 θερμίδες ανά γεύμα εκτοξεύθηκαν στις 1.550 ενώ ταυτόχρονα αυξήθηκαν και οι συσκευασίες αναψυκτικών όπως π.χ. η φιάλη της Coca-Cola από 236 ml το 1970 σε 591 ml σήμερα

COMMENTARY

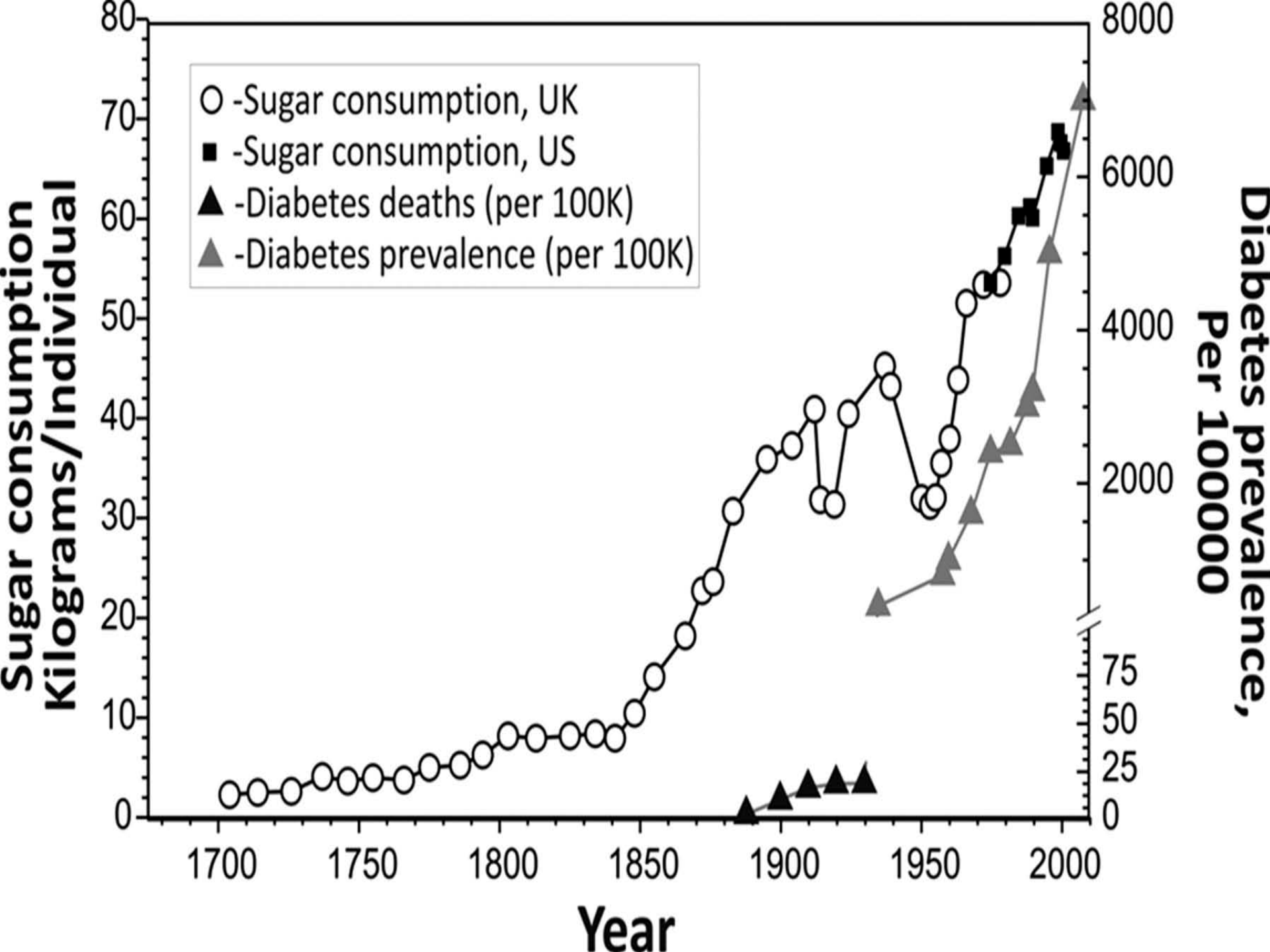
Origins and evolution of the Western diet: health implications for the 21st century

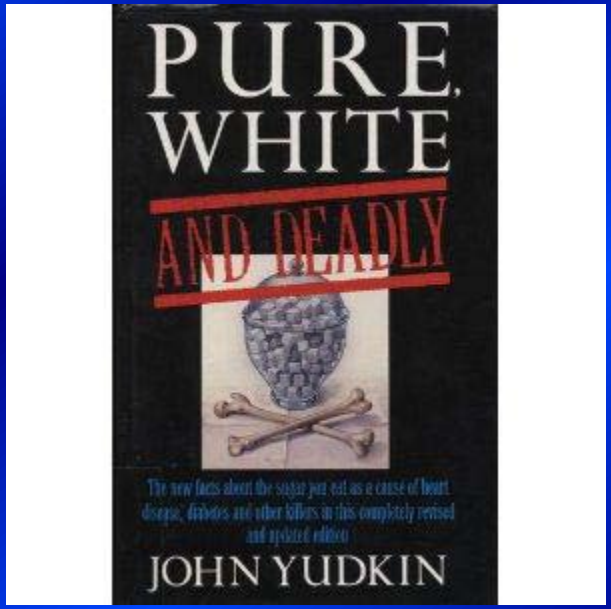
Loren Cordain, S Boyd Eaton, Anthony Sebastian, Neil Mann, Staffan Lindeberg, Bruce A Watkins, James H O'Keefe and Janette Brand-Miller



Per capita consumption of refined sugars in the United States from 1970 to 2000. Adapted from the US Department of Agriculture (24).

American Journal of Clinical Nutrition, Vol. 81, No. 2, 341-354, February 2005


O -Sugar consumption, UK
■ -Sugar consumption, US
▲ -Diabetes deaths (per 100K)
▲ -Diabetes prevalence (per 100K)
Sugar consumption
Kilograms/Individual
Diabetes prevalence,
Per 100000
Year
0
10
20
30
40
50
60
70
80
0
25
50
75
2000
4000
6000
8000
1700
1750
1800
1850
1900
1950
2000

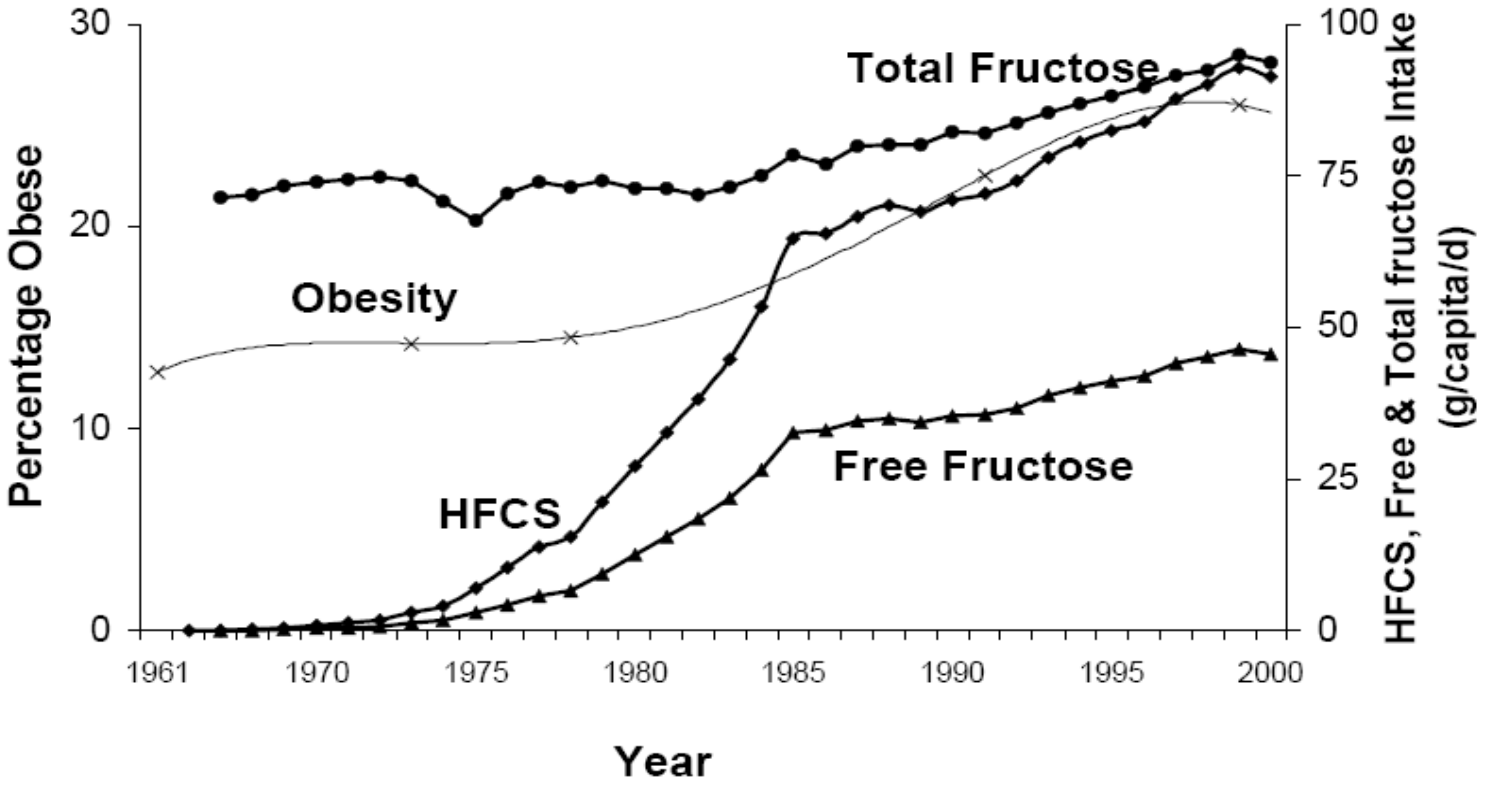


Pure, white and deadly
the problem of sugar.
Published **1972** by Davis-Poynter Ltd in London

Just as HFCS was appearing in the US food supply, Professor Yudkin (1) wrote a book titled *Pure, White and Deadly*, in which he attributed the rising risks of obesity and heart disease to sugar.

The attribution "pure, white, and deadly" to sugar by Professor Yudkin in 1972 may yet be partly right. It is the fructose part of the sucrose (table sugar) molecule and the fructose from HFCS that best fits the title. (**Fructose: Is It Bad For Our Health?** George A. Bray, MD 2008.)

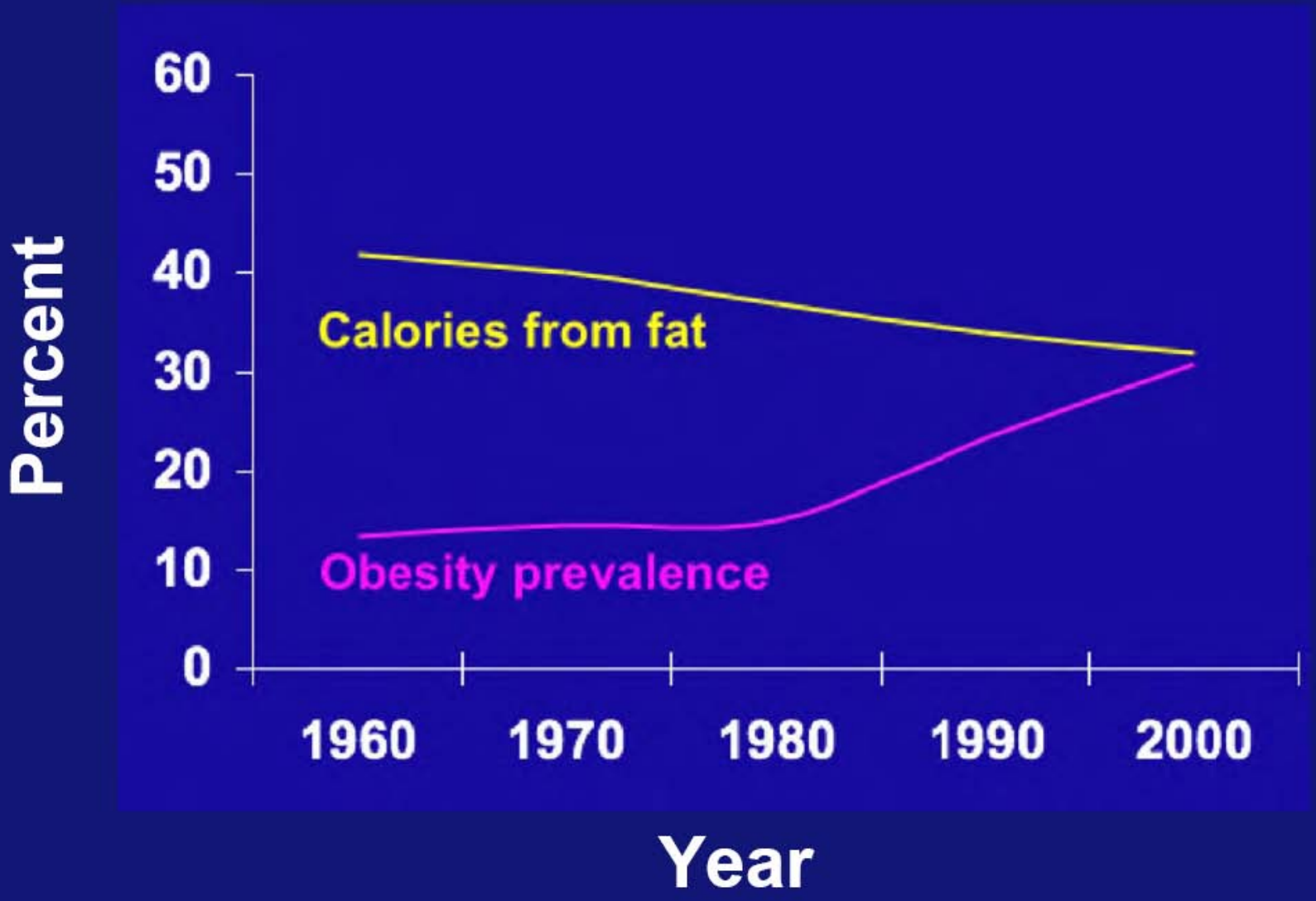
HFCS, Free and Total Fructose Consumption And Prevalence for Obesity and Overweight

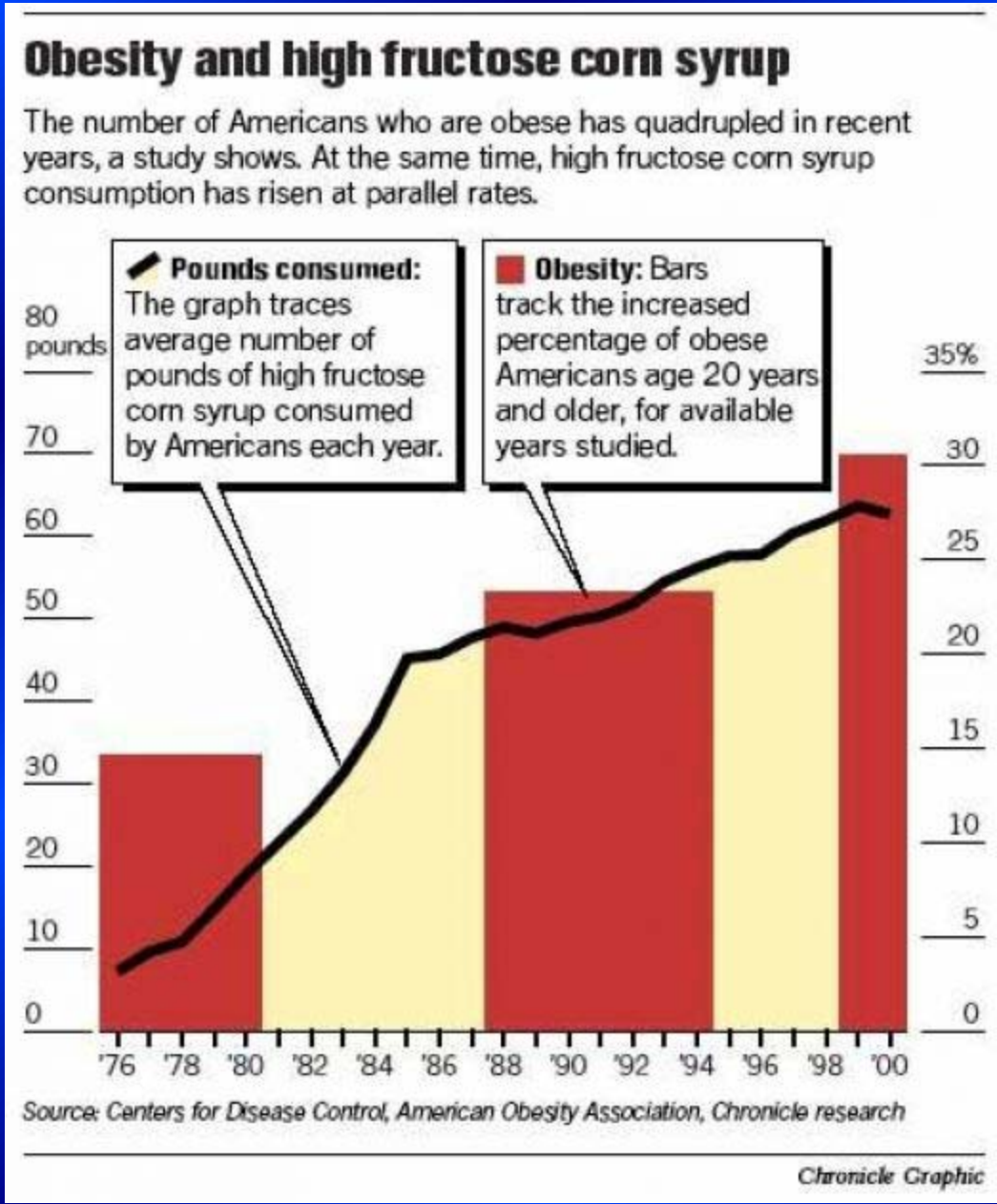


Bray, Nielsen & Popkin, AJCN 2004;79: 537-544

Changing intake of fructose and high-fructose corn syrup intake plotted against the rising prevalence of obesity. (Reprinted from Reference 17)
Fructose differs in several ways from glucose, the other half of the sucrose (table sugar). Bray, Nielsen & Popkin, AJCN 2004;79: 537-544

Prevalence of Obesity Compared to Percent Calories from Fat Among US Adults

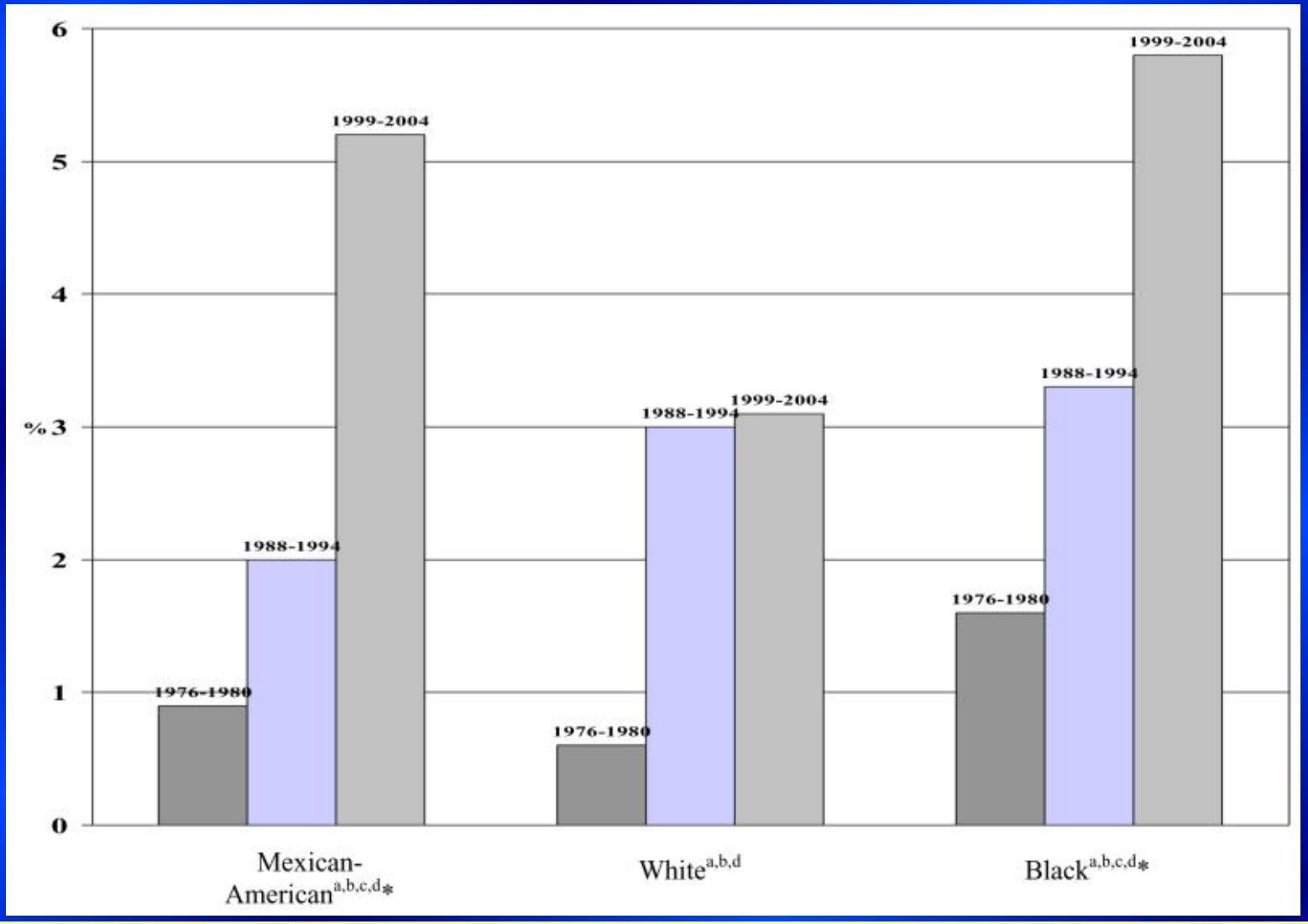




Relationship Between Obesity and HFCS

***Acad Pediatr.* 2009 Sep–Oct; 9(5): 322–329.**

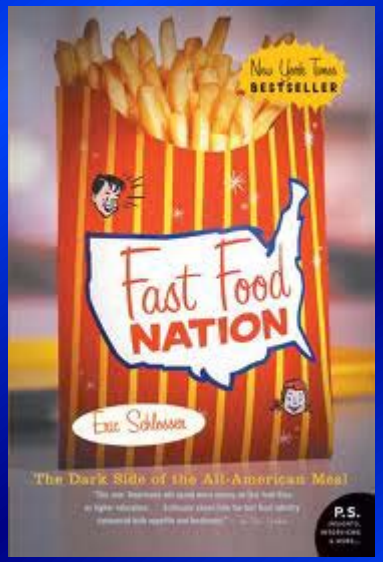
Prevalence and Trends of Severe Obesity among US Children and Adolescents



Prevalence of BMI ≥99th Percentile Among U.S. Children Ages 2–19 Years, NHANES II (1976–1980), NHANES III (1988–1994) and NHANES 1999–2004, by race/ethnic groups

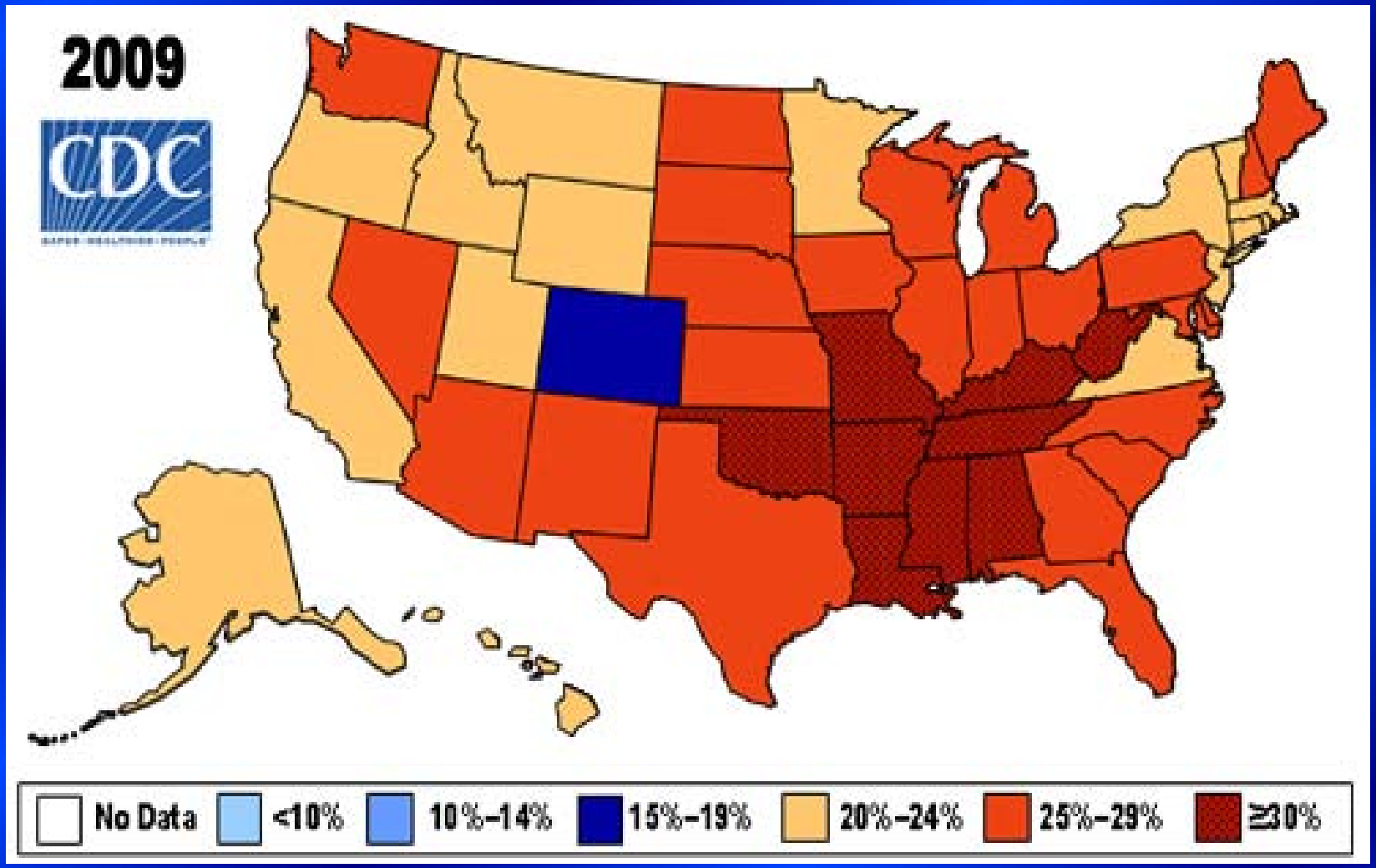
Arteriosclerosis, Thrombosis, and Vascular Biology. 2005;25:2451.)

Brief Reviews
Fast Food, Central Nervous System Insulin Resistance, and Obesity
Elvira Isganaitis; Robert H. Lustig



Η αύξηση της σοβαρής παιδικής παχυσαρκίας τριπλασιάστηκε κατά τα τελευταία 3 χρόνια με σημαντικές διαφορές για τη φυλή, το φύλο και την οικονομική κατάσταση.
(Acad Pediatr. 2009 Sep–Oct; 9(5): 322–329
Prevalence and Trends of Severe Obesity among US Children and Adolescents)

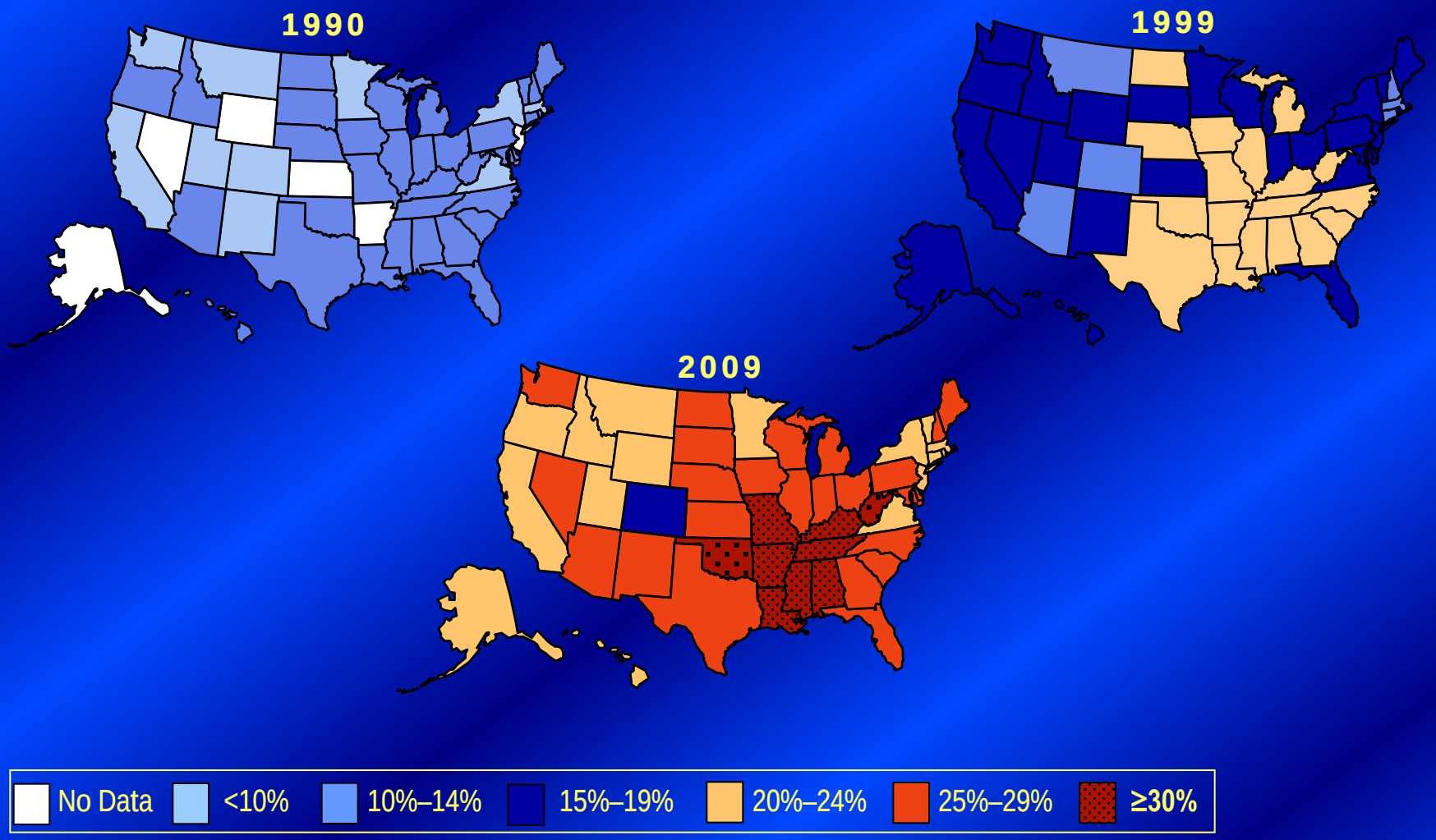
Percent of Obese (BMI ≥ 30) in U.S. Adults



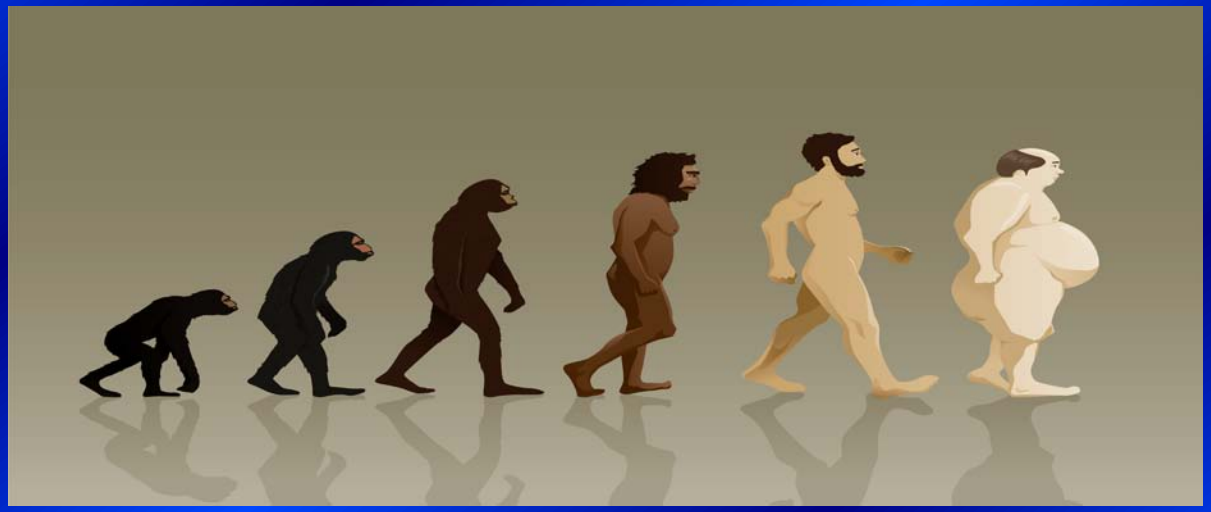
Obesity Trends* Among U.S. Adults

BRFSS, 1990, 1999, 2009

(*BMI ≥30, or about 30 lbs. overweight for 5'4" person)



ObesityEpidemic.Org



Evolution of mankind showing last stage with final potbelly

The US has the fattest population of all time!! Around two thirds of the population is overweight or obese.

The Fructose Wars - Fat is No Longer a Choice
By Ray Savant

The number one source of calories in America is from High Fructose Corn Syrup in soda pop.

- Drink a 6.5 oz Soda every day = 8 lbs of belly fat a year
  192 ml 3.6 kg
- Drink a 10 oz Soda every day = 13 lbs of belly fat a year
  295 ml 5.8 kg
- Drink a 12 oz Soda every day= 16 lbs of belly fat a year
  354 ml 7.2 kg
- Drink a 20 oz Soda every day = 26 lbs of belly fat a year
  591 ml 11.7 kg
- Drink a 44 oz Soda every day = 57 lbs of belly fat a year
  1301 ml 25.8 kg

Review

Fructose, insulin resistance, and metabolic dyslipidemia

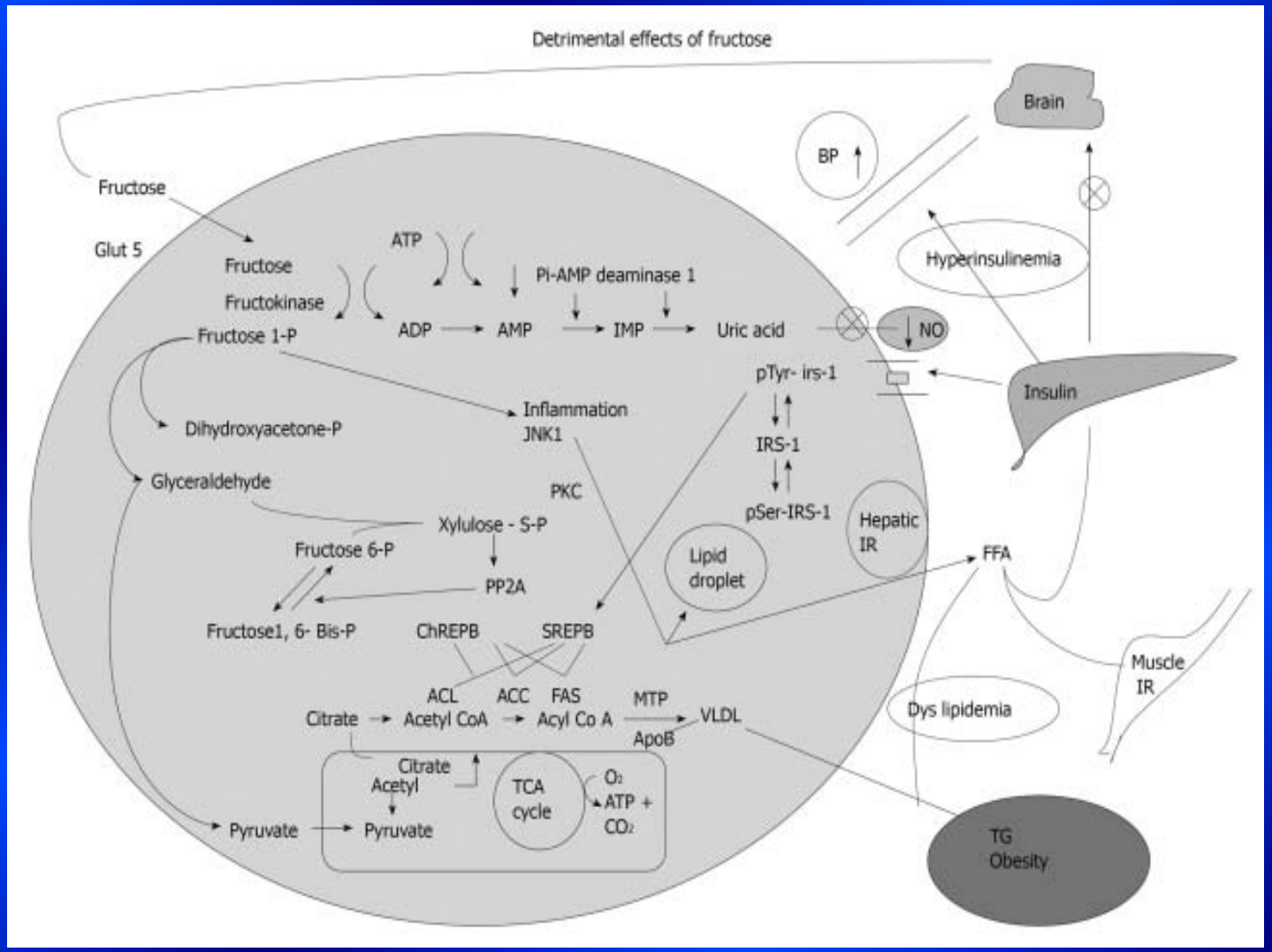
Heather Basciano, **Lisa Federico** and **Khosrow Adeli**

Nutrition & Metabolism 2005, **2:**5

Clinical Biochemistry Division, Department of Laboratory Medicine and Pathobiology, Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada

Obesity and type 2 diabetes are occurring at epidemic rates in the United States and many parts of the world. The "obesity epidemic" appears to have emerged largely from changes in our diet and reduced physical activity. An important but not well-appreciated dietary change has been the substantial increase in the amount of dietary fructose consumption from high intake of sucrose and high fructose corn syrup, a common sweetener used in the food industry

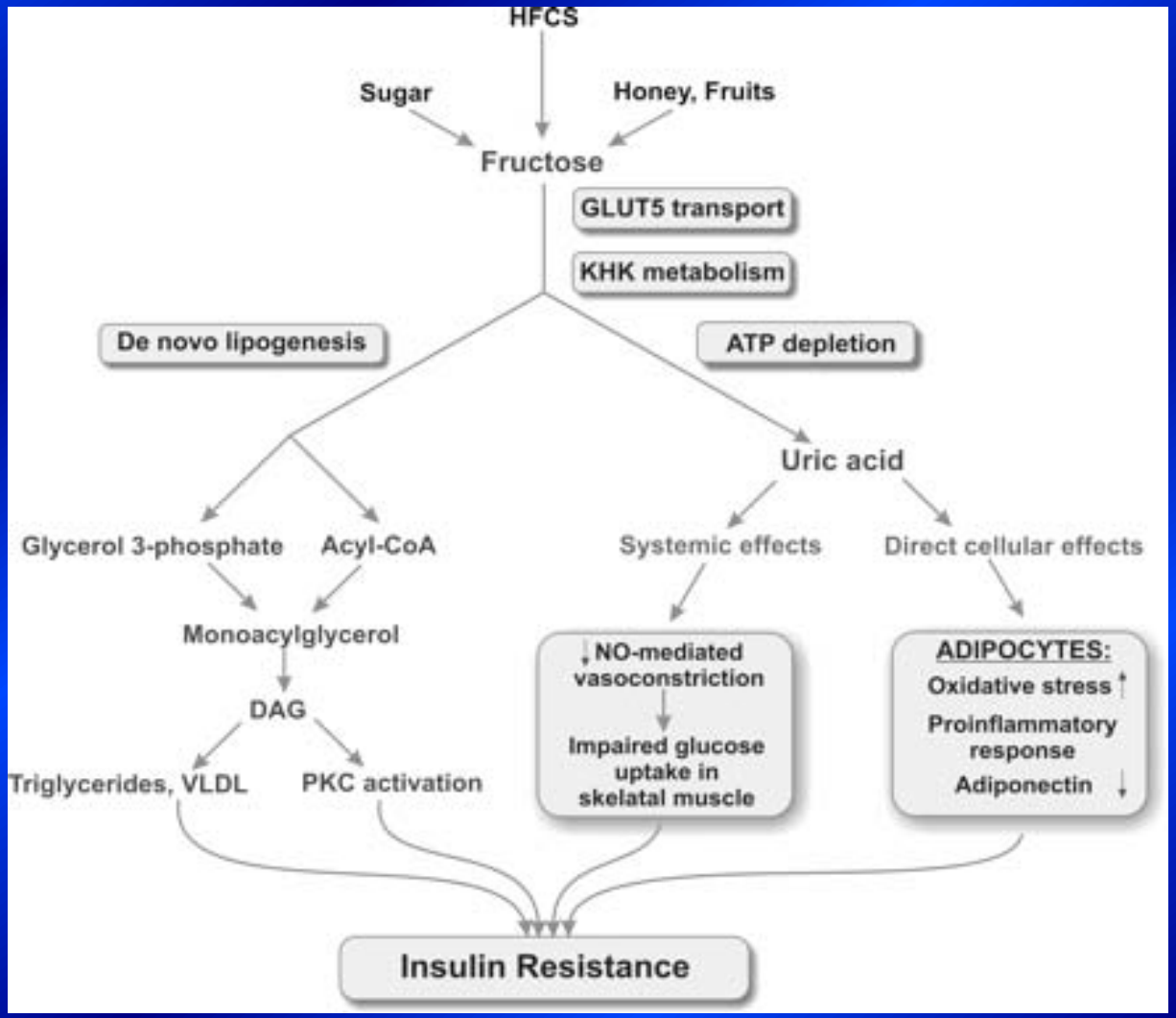
Soft drinks consumption and nonalcoholic fatty liver disease
William Nseir, Fares Nassar, and Nimer Assy



Mechanisms of detrimental effects of fructose. ***World J Gastroenterol.*** **2010 June 7; 16(21): 2579–2588**

Endocrine Reviews 30 (1): 96-116

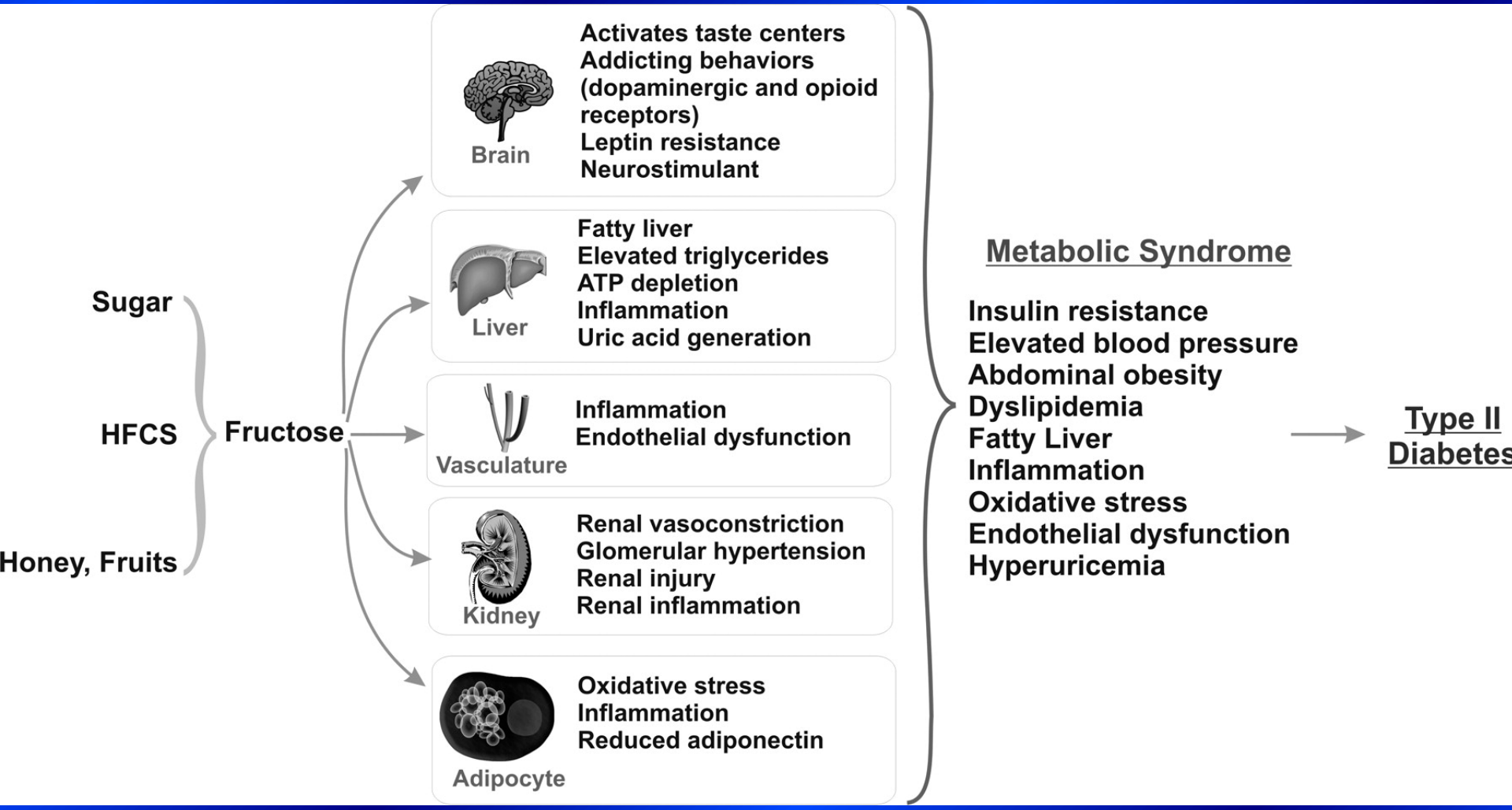
Hypothesis: Could Excessive Fructose Intake and Uric Acid Cause Type 2 Diabetes?



Potential mechanisms by which fructose and uric acid may induce insulin resistance.

Endocrine Reviews 30 (1): 96-116

Hypothesis: Could Excessive Fructose Intake and Uric Acid Cause Type 2 Diabetes?



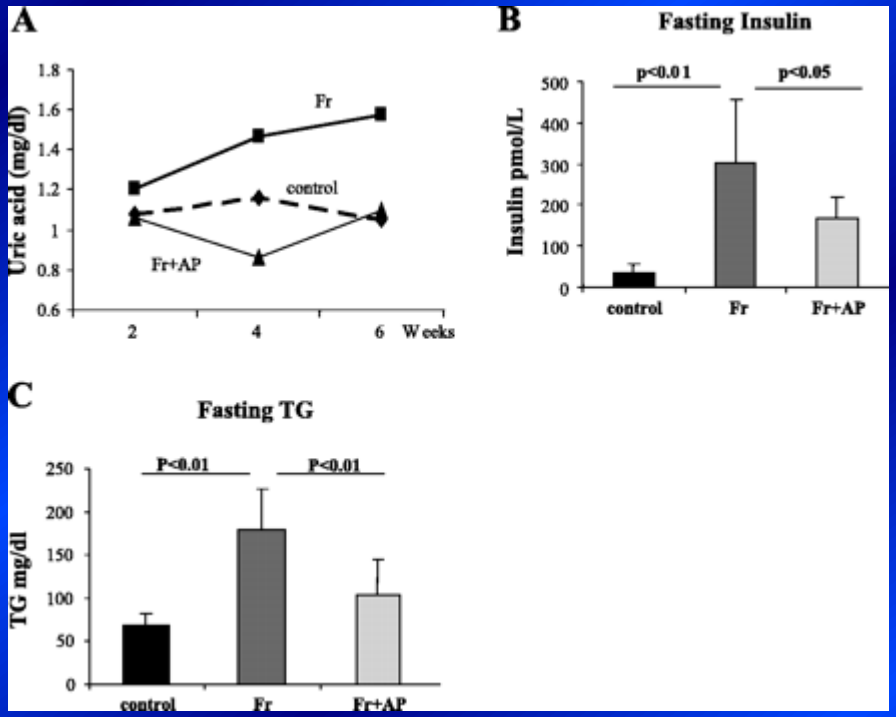
Effect of fructose on various organ systems.

Editorials
The Fructose Nation
Eric G. Neilson *Departments of Medicine and Cell and Developmental Biology, Vanderbilt University School of Medicine, Nashville, Tennessee*
Published ahead of print on September 5, 2007
J Am Soc Nephrol 18: 2619-2621, 2007

So what is the problem with fructose? Fructose is metabolized differently than glucose. Unlike glucose, which is stored as glycogen, fructose is absorbed by the gut and converted into triglycerides by the liver.12 Fructose also elevates uric acid levels through effects on an ADP-IMP pathway in hepatocytes.13 The resulting dyslipidemia and hyperuricemia facilitate insulin resistance,14 aggravate hypertension,13 and accelerate endothelial dysfunction.15 Attenuation of nitric oxide levels is an important pathogenic mechanism as a final common pathway to poor blood flow.3,16 What we end up with is a familiar caloric additive provoking a new spate of metabolic dysfunction.

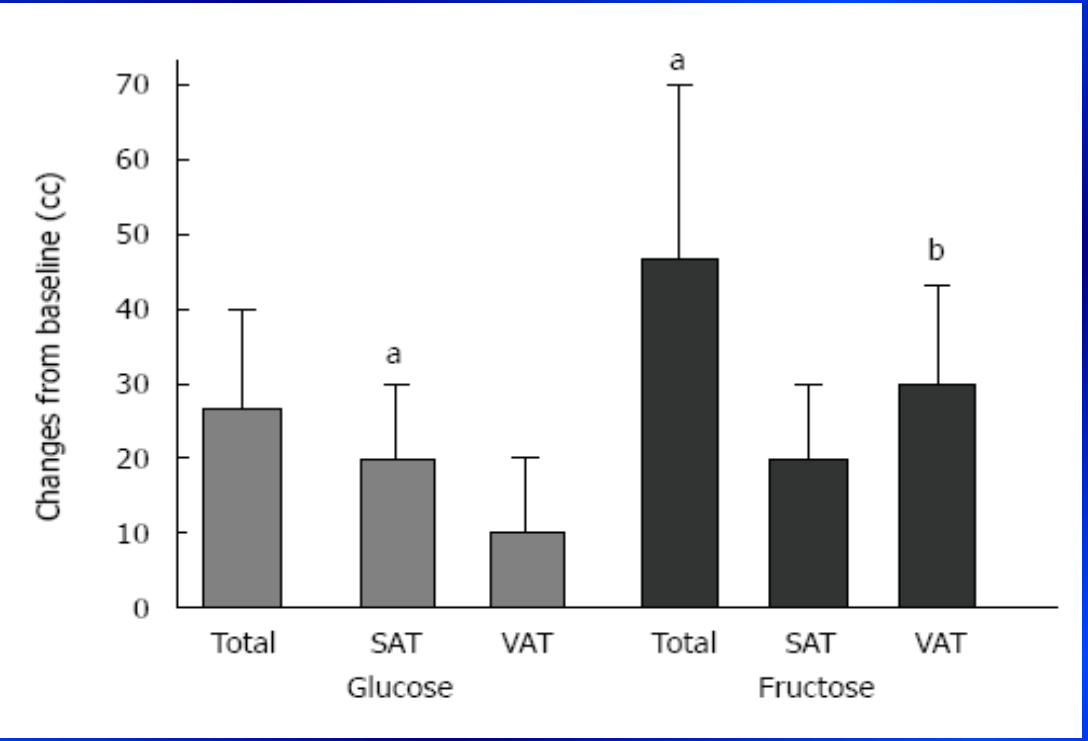
Am J Physiol Renal Physiol 290: F625-F631, 2006. First published October 18, 2005;

A causal role for uric acid in fructose-induced metabolic syndrome



Blocking of hyperuricemia in Fr rats with AP prevents features of metabolic syndrome. *A*: AP (150 mg/l) prevented the rise in UA in Fr rats. $P < 0.05$ vs. control and Fr+AP. *B*: AP treatment was associated with significantly lower fasting insulin levels compared with Fr rats at 8 wk. *C*: AP also prevented the increase in triglycerides induced with fructose

Soft drinks consumption and nonalcoholic fatty liver disease
World J Gastroenterol 2010 June 7; 16(21): 2579-2588

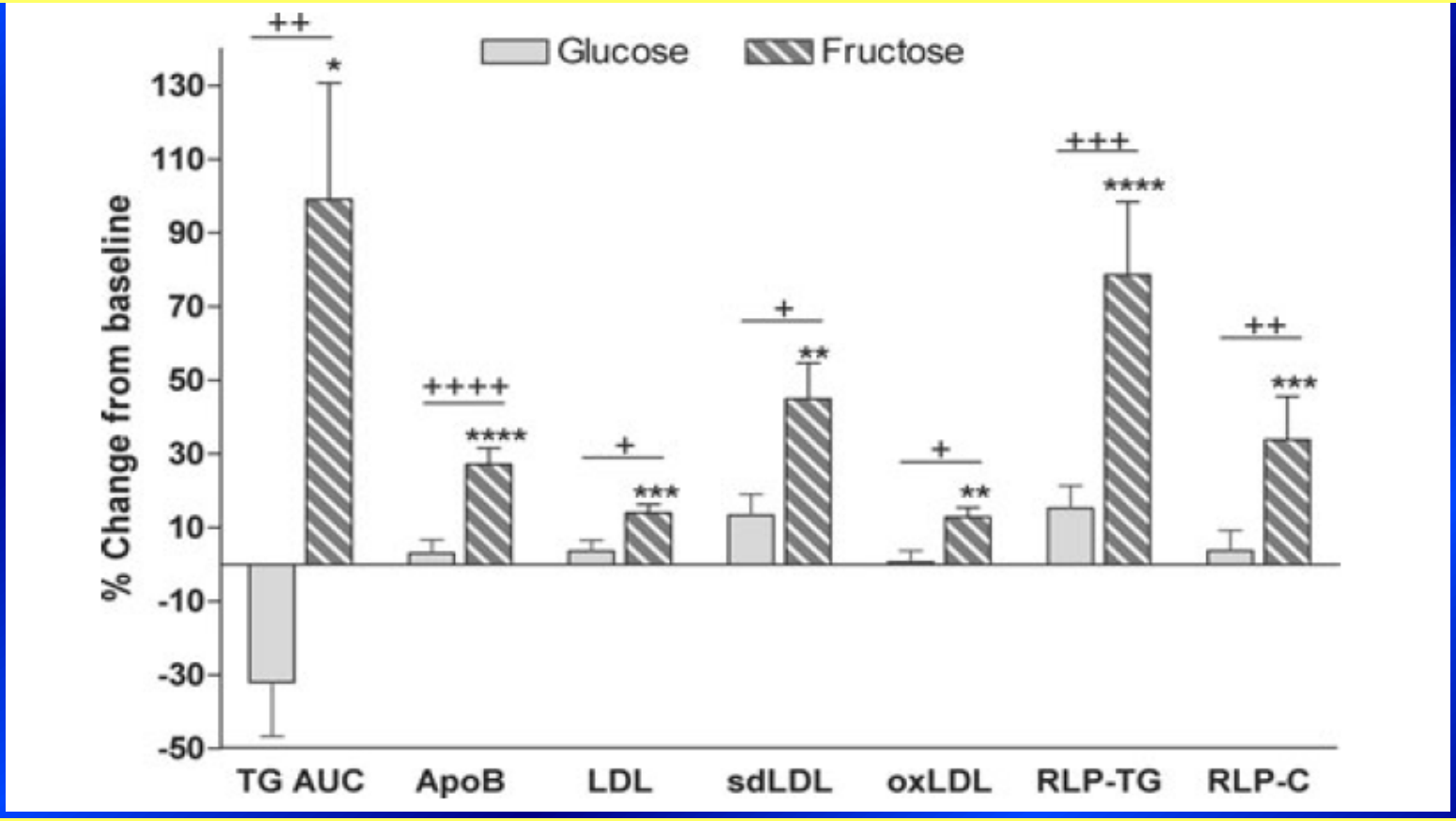


Changes in total abdominal adipose tissue, superficial adipose tissues (SAT), and visceral adipose tissue (VAT) volume after consuming glucose- or fructose-sweetened beverages for 10 wk.

Ann. N.Y. Acad. Sci. 1190 (2010) 15–24 c 2010 New York Academy of Sciences.

Fructose consumption: recent results and their potential implications

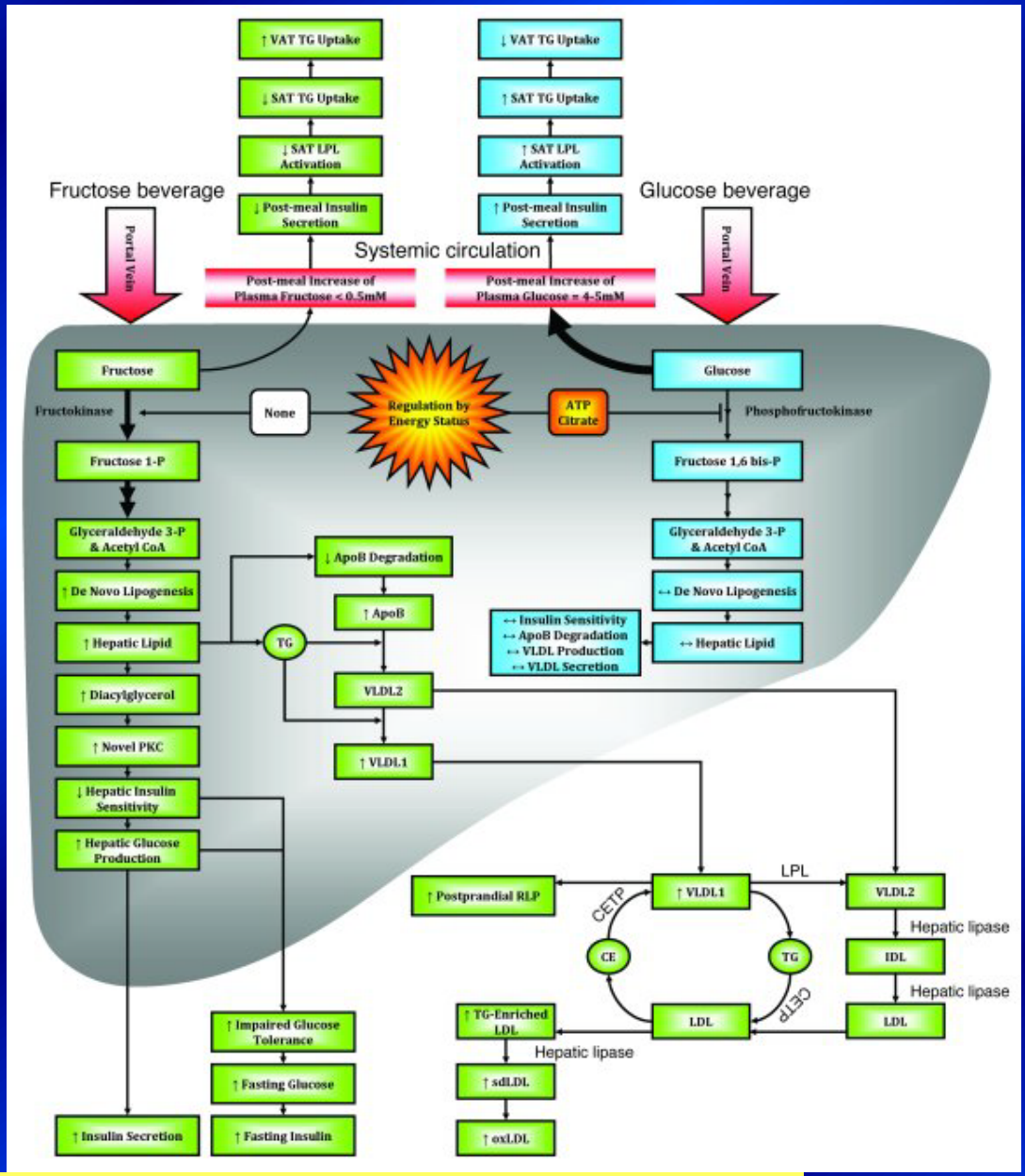
Kimber L. Stanhope and Peter J. Havel



Lipids and lipoproteins: percent changes from baseline of 24-h TG under the curve (AUC), fasting concentrations of apoB, LDL, sdLDL, and oxidized (oxLDL), and postprandial concentrations of remnant-like particle lipoprotein (RLP)-TG and RLP-Cholesterol (RLP-C) in subjects after 10 weeks of consuming glucose- or fructose sweetened beverages.

Published in Volume 119, Issue 5 (May 1, 2009) *J Clin Invest.* 2009;119(5):1322–1334.

Consuming fructose-sweetened, not glucose-sweetened, beverages increases visceral adiposity and lipids and decreases insulin sensitivity in overweight/obese humans



Proposed mechanisms underlying the differential effects of fructose and glucose consumption

Fructose and the Metabolic Syndrome: Pathophysiology and Molecular Mechanisms

Angela C. Rutledge, BSc, PhD, and Khosrow Adeli, PhD, FCACB, DABCC

June 2007(II): S13–S23

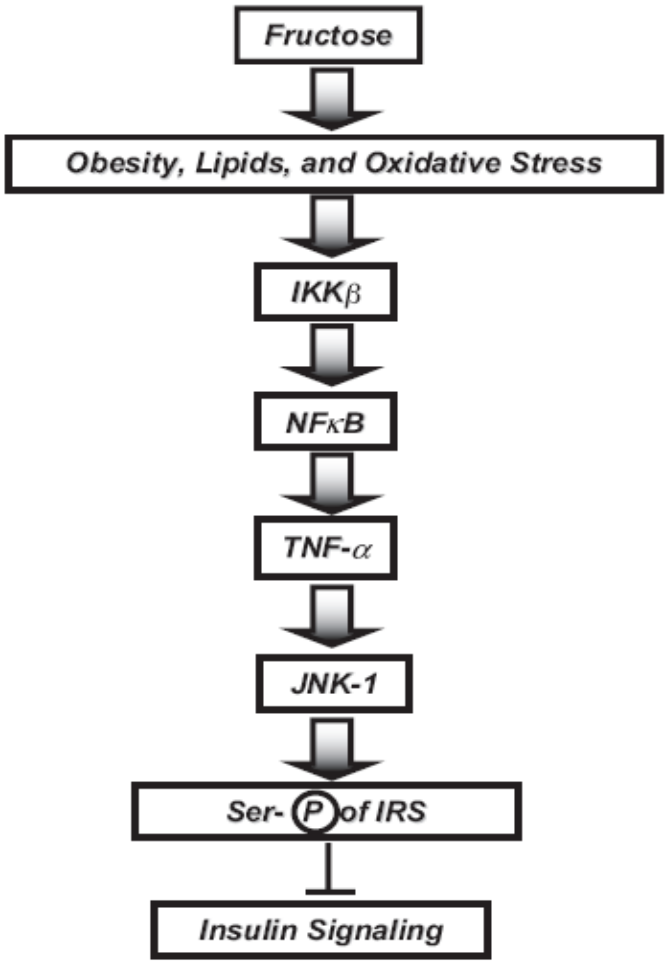
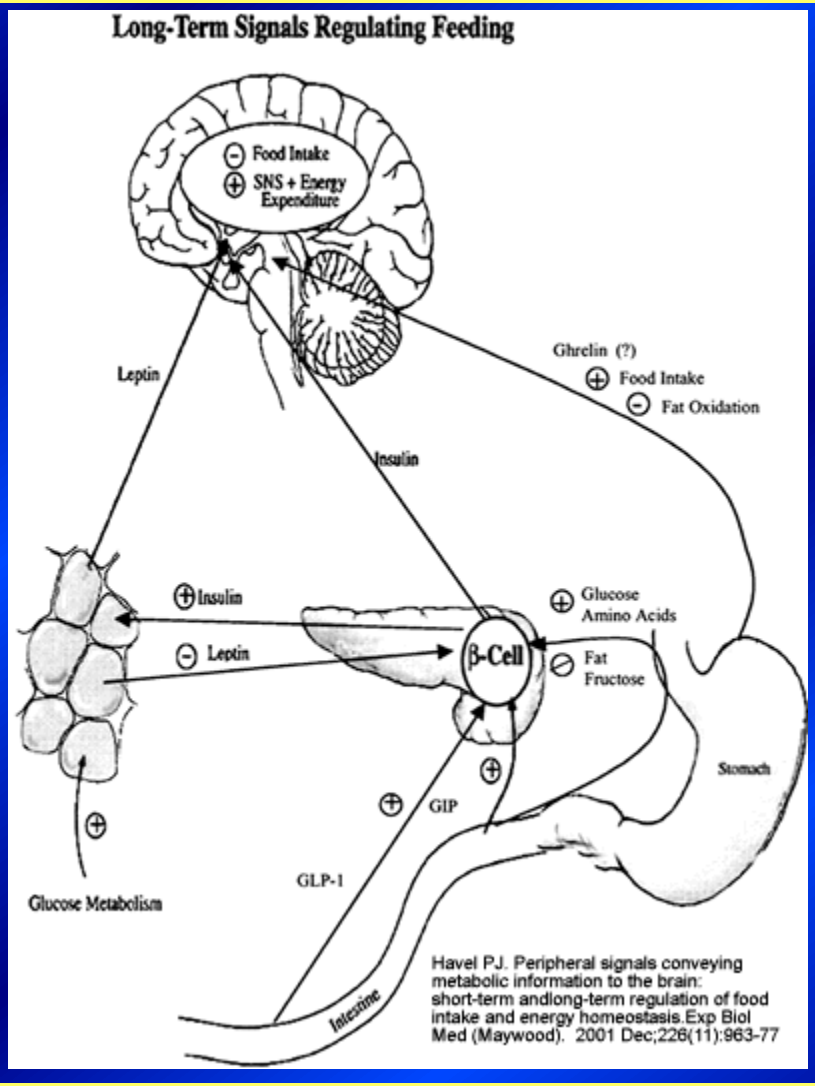


Figure 2. Overview of the nuclear factor kappa B (NFkB)/c-Jun amino terminal kinase 1 (JNK-1) pathway proposed to link fructose consumption and inflammation and lead to hepatic insulin resistance.

Dietary Fructose: Implications for Dysregulation of Energy Homeostasis and Lipid/Carbohydrate Metabolism

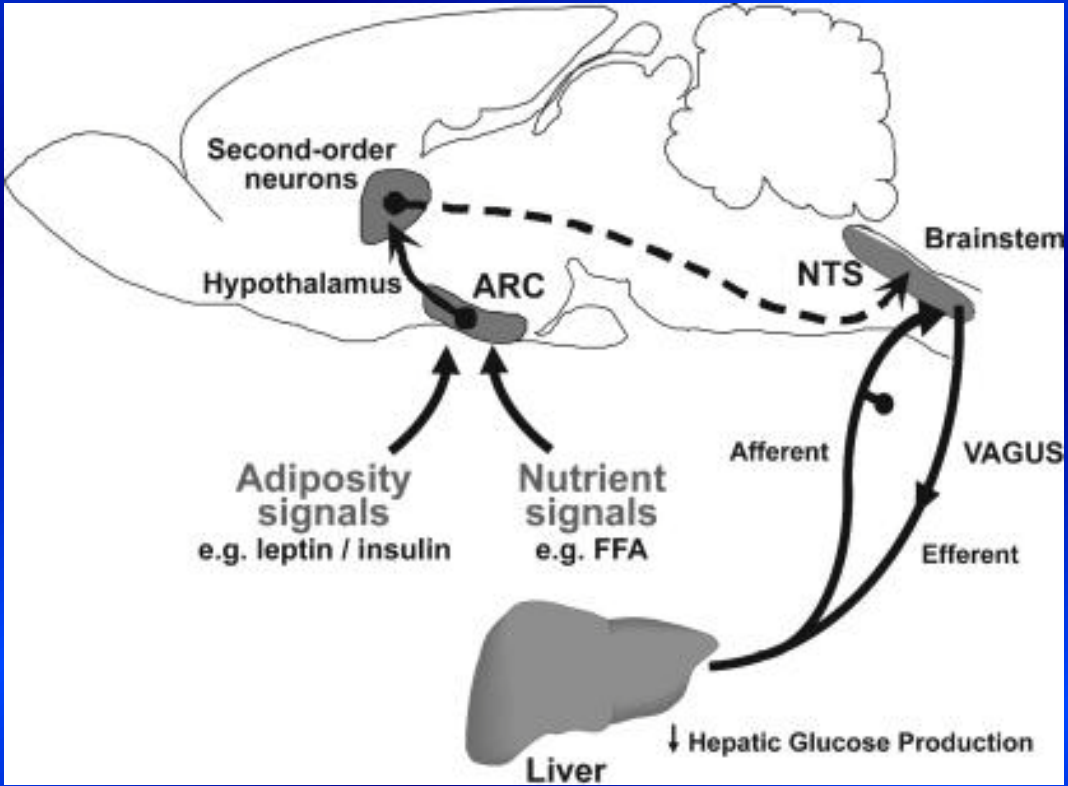
Author: Havel, Peter J.

Source: Nutrition Reviews, Volume 63, Number 5, May 2005 , pp. 133-157



Long-term signals regulating food intake and energy homeostasis.

J Physiol. 2007 Sep 1;583(Pt 2):437-43.
Hypothalamic leptin regulation of energy homeostasis and glucose metabolism.
Morton GJ.



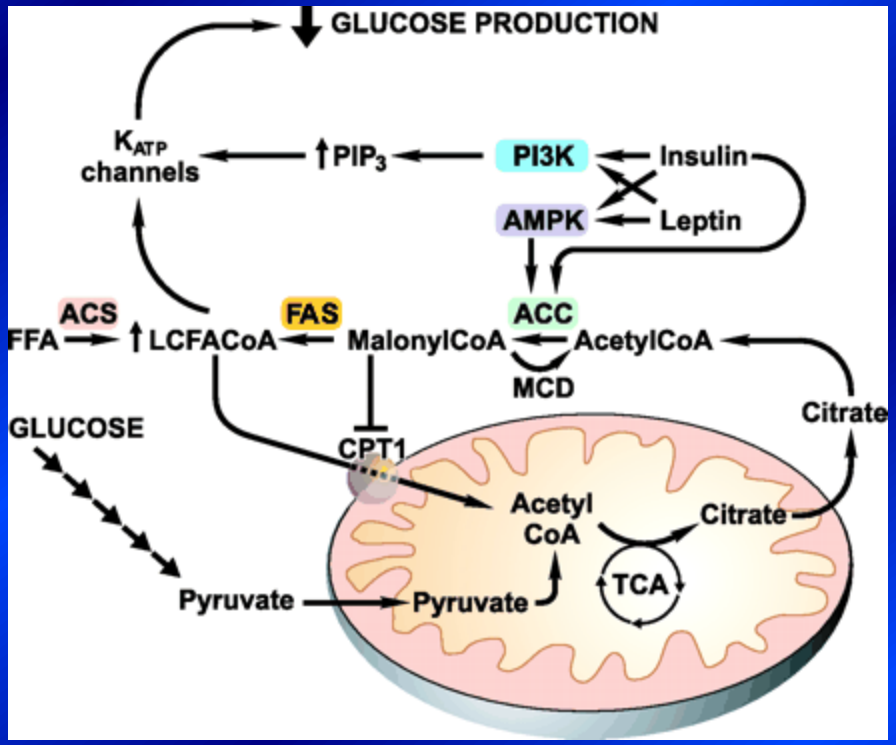
Model of the hypothalamic regulation of hepatic glucose production
Both insulin activation of the IRS-PI3K pathway and increased concentration of LCFA-CoA levels in the ARC are proposed to activate second-order neurons that project to hindbrain areas. In response to this input, output of motor neurons of the vagus nerve that supply the liver is increased (adapted from Pocai *et al*. 2005*b*). ARC, arcuate nucleus; NTS, nucleus of the solitary tract; FFA, free fatty acids.


CORN
THE FOOD OF THE NATION
SERVE SOME WAY EVERY MEAL
APPETIZING
NOURISHING
ECONOMICAL
CORN MEAL
GRITS
HOMINY
UNITED STATES FOOD ADMINISTRATION

Endocrinology Vol. 147, No. 6 2664-2669

Minireview: The Brain as a Molecular Target for Diabetic Therapy

Elena Prodi and Silvana Obici

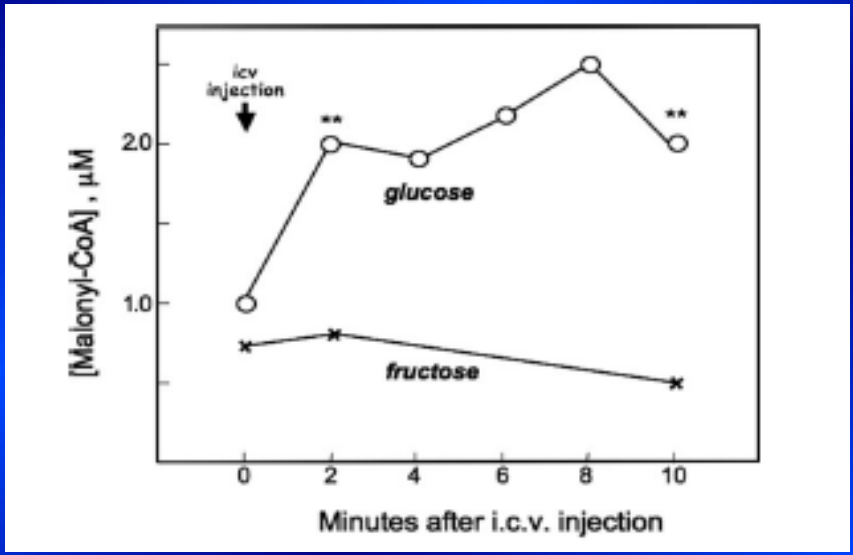


Model of neuronal integration of metabolic and endocrine signals involved in regulation of glucose production. The hypothalamic sensing of macronutrients integrates multiple hormonal and metabolic homeostatic signals. Both glucose and FFAs can influence the intracellular levels of LCFA-CoAs.

Differential effects of central fructose and glucose on hypothalamic malonyl–CoA and food intake

Seung Hun Chaa, Michael Wolfganga, Yuka Tokutakeb, Shigeru Chohnanb, and M. Daniel Lanea,

PNAS **November 4, 2008** vol. 105 no. 44 **16871–16875**



Effect i.c.v. injection of fructose and glucose on the level of hypothalamic malonyl–CoA. Food-deprived mice were given i.c.v. injections (400 g/2 l) of fructose or glucose at the indicated times the malonyl–CoA levels in hypothalami were quantified (*n* 4 mice per group). **, *P* 0.001.

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Glucose → ⇑[ATP] → ⇓[AMP] → dephospho-AMPK → (*inactive*)

dephospho-ACC (*active*) → ⇑[malonyl-CoA] → ⇓food intake.

Fructose → ⇓[ATP] → ⇑[AMP] → phospho-AMPK → (*active*)

phospho-ACC (*inactive*) → ⇓[malonyl-CoA] → ⇑food intake

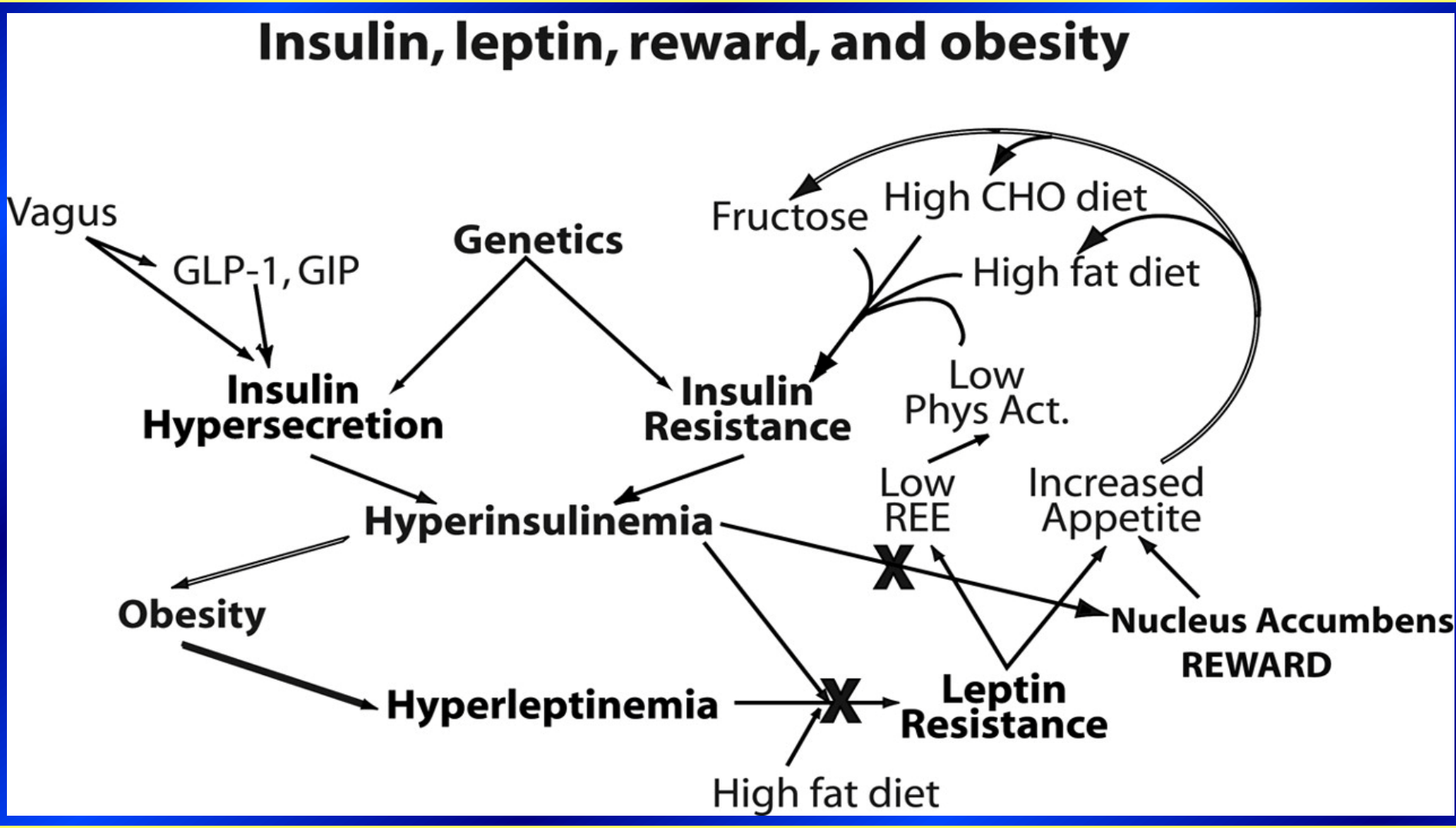
Thus, fructose has the opposite effect of glucose on the AMPK/malonyl-CoA signaling system and thereby, feeding behavior. The fact that fructose metabolism by the brain increases food intake and obesity risk raises health concerns in view of the large and increasing per capita consumption of high fructose sweeteners, especially by youth.

Biochem Biophys Res Commun. 2009 Apr 24;382(1):1-5. Epub 2009 Mar 3.

Effect of glucose and fructose on food intake via malonyl-CoA signaling in the brain.

Like just about everything that once used sugar as a sweetener, imitation syrups now use high fructose corn syrup (HFCS), the nasty goop that's helping turn America into a nation of fat slobs.

Fast Food, Central Nervous System Insulin Resistance, and Obesity



Postulated algorithm describing the role of hyperinsulinemia, and in particular, CNS insulin resistance, in the dysfunction of the energy balance pathway, by promoting leptin resistance in the hypothalamus, and fostering increased reward at the nucleus accumbens; which turns the pathway from a feed-back into a feed-forward paradigm.

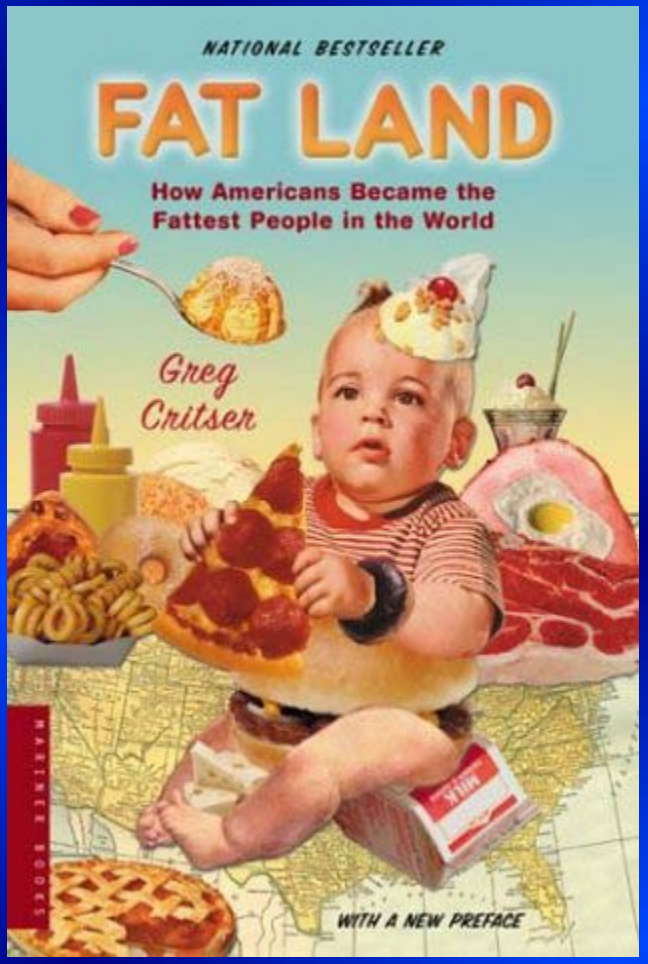
Arteriosclerosis, Thrombosis, and Vascular Biology. 2005;25:2451

Tuesday, August 11, 2009

The Sweet Taste of Stupidity

Remember the good old days when the only worries linked to high fructose corn syrup were obesity and diabetes? Now we get reports like **this** in Mother Jones. Looks like we might be able to add impaired neurological development and reduced cognitive thinking to the list. A recent study suggests that our beloved national treasure, high fructose corn syrup, may indeed be contaminated with mercury. Sweet.

High Fructose Corn Syrup: don't use it



The leading theory about the cause of Alzheimer's disease implicates insulin. Insulin concentrations in the brain drop significantly in early Alzheimer's and continue to fall as the disease worsens, suggesting that Alzheimer's disease may be Type III diabetes.

The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages
N Engl J Med 2010;362(13):1250.

Obesity In America: A "Calorie-Added Tax" Will Redistribute High-Fructose Corn Syrup Subsidies To Pay For Health Care

From 1970 to 1990 alone, our intake of high-fructose corn syrup rose more than 1,000% per person, paralleling our skyrocketing rates of obesity

The federal government, a number of states and cities, and some countries (e.g., Mexico8) are considering levying taxes on sugar-sweetened beverages. The reasons to proceed are compelling. The science base linking the consumption of sugar-sweetened beverages to the risk of chronic diseases is clear. Escalating health care costs and the rising burden of diseases related to poor diet create an urgent need for solutions, thus justifying government's right to recoup costs

For the first time in American history, our generation was at risk of having a shorter lifespan than our parents. And it was because of what we ate.”

—Curt Ellis, KING CORN filmmaker

American Eating Habits Causing Health Concerns
All Corn Diets are Killing Americans and Raising Healthcare Costs
Apr 1, 2010 Keith Cronin

Billions of bushels of corn support over 200 different foods and products. Though keeping food costs down, healthcare costs are rising and diabetes is increasing

While food expenditures are down, healthcare has more than tripled. Improvements in technologies, medications, and increased life expectancy account for some spending increases, but an expanding population of obesity and diabetics is crushing the system. A suggested link to an unhealthy America is the overutilization of corn.

The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages

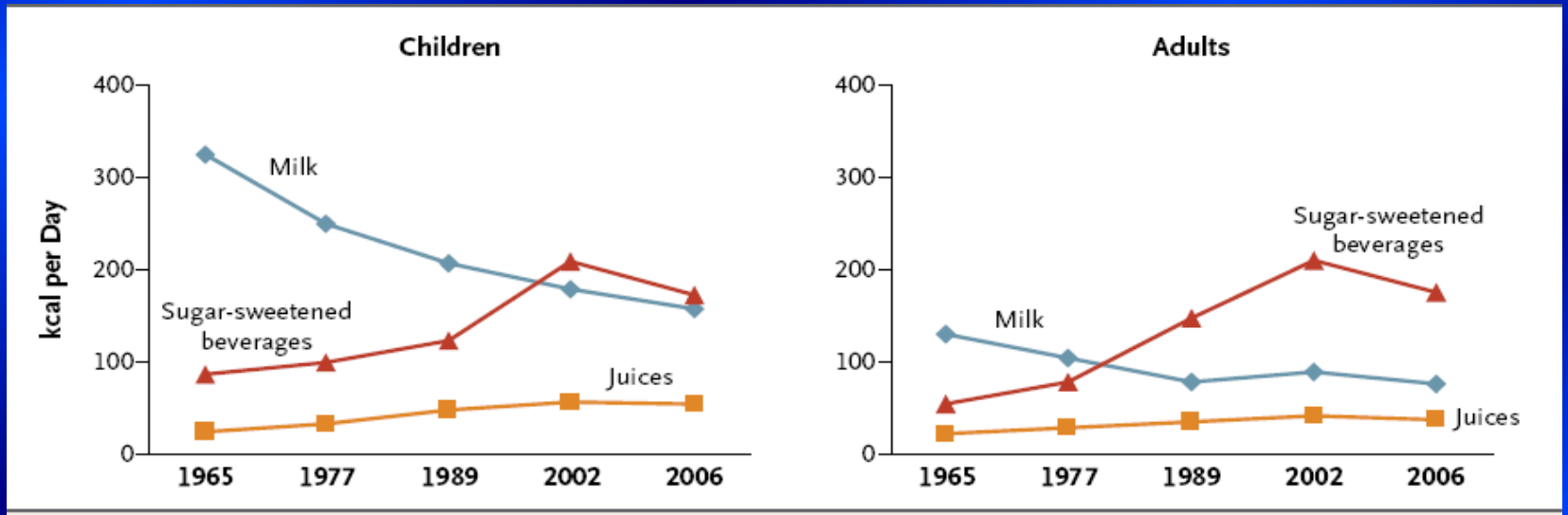


Figure 1. U.S. Trends in Per Capita Calories from Beverages.

Data are for U.S. children 2 to 18 years of age and adults 19 years of age or older. Data have been weighted to be nationally representative, with the use of methods that generate measures of each beverage that are comparable over time. Data for 1965–2002 are from Duffey and Popkin[9]; data for 2005–2006 have not been published previously.

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N Engl J Med 2010; 362:368-369, Jan 28, 2010.

'Corn Sugar' Makers Hope You'll Buy The New Name

September 19, 2010

A television advertisement from the Corn Refiners Association

High fructose corn syrup became a popular choice for companies decades ago because it's less expensive than traditional sugar and comes in a handy liquid form that makes it easy to use. But during the last few years, its reputation has taken a beating.

It started in 2004, when a widely read report suggested high fructose corn syrup was a major cause of the obesity epidemic.

Documentaries such as *Fast Food Nation* and *King Corn* also raised concerns about the ingredient and blamed it for contributing to diabetes and obesity.

Journal of the American Dietetic Association

Volume 110, Issue 9, Pages 1307-1321 (September 2010)

Fructose: Metabolic, Hedonic, and Societal Parallels with Ethanol

Robert H. Lustig,

Lastly, by stimulating the “hedonic pathway” of the brain both directly and indirectly, fructose creates habituation, and possibly dependence; also paralleling ethanol. Thus, fructose induces alterations in both hepatic metabolism and central nervous system energy signaling, leading to a “vicious cycle” of excessive consumption and disease consistent with metabolic syndrome. On a societal level, the treatment of fructose as a commodity exhibits market similarities to ethanol. Analogous to ethanol, societal efforts to reduce fructose consumption will likely be necessary to combat the obesity epidemic.

American Eating Habits Causing Health Concerns
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Consuming Too Much Corn is Progressing Diabetes

CORNification of America

Advocates for healthier eating, such as Michael Pollen and Jamie Oliver, are the bulls-eye for several different lobbying groups that want to maintain the status quo. The problem with the current system is that these industries depend on people to purchase their products to make money. *Americans are unhealthy and dying*.The status quo will only change when America demands change. Farmers will grow different crops, food production companies will utilize different methods, and ranchers will return to feeding cattle grass only if people demand it.

Diabetes, heart disease, and the multitude of ailments associated with obesity are a direct cause of diet. If the expression "you are what you eat" is true, then American cities are no more than an urban collection of walking, talking, and breathing corn. America must have a voice, otherwise, it will suckle from an insulin pump to an uncertain future and watch a generation of children perish before its eyes.

Ο ρόλος της φρουκτόζης στη διατροφή του ατόμου με ΣΔ

Συμπεράσματα

• Η μεγάλη αύξηση της παχυσαρκίας και των άλλων εκδηλώσεων του μεταβολικού συνδρόμου που ακολούθησαν την αύξηση της κατανάλωσης φρουκτόζης με τη μορφή σιροπιού φρουκτόζης στα αναψυκτικά και στα επεξεργασμένα τρόφιμα στις Η.Π.Α κυρίως, καθώς και ένας μεγάλος όγκος δεδομένων για τις δυσμενείς μεταβολικές επιδράσεις της κατανάλωσης αυξημένων ποσοτήτων φρουκτόζης, ανάγκασε την Αμερικανική Διαβητολογική Εταιρία να συστήσει την αποφυγή της φρουκτόζης σαν γλυκαντικής ουσίας.

• Με δεδομένο ότι στο σύγχρονο καταναλωτικό περιβάλλον είναι σχεδόν αδύνατο να ελέγξει κανείς την ημερήσια πρόσληψη φρουκτόζης μέσω των επεξεργασμένων τροφίμων, φαίνεται απόλυτα λογική η σύσταση της μη χρησιμοποίησής της σαν γλυκαντικής ουσίας στο διαιτολόγιο των διαβητικών, ενώ διαφαίνεται ότι και η χρήση της ζάχαρης που περιέχει φρουκτόζη κατά 50%, θα πρέπει να αντιμετωπίζεται με σκεπτικισμό από άτομα με σακχαρώδη διαβήτη ή κίνδυνο ανάπτυξης μεταβολικού συνδρόμου.

Β. Λιμενόπουλος