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Presentation from the USDA Agricultural Outlook Forum 2017

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“A New Horizon: The Future of Agriculture”

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American's health and the perceived healthfulness of their sweeteners

USDA Agricultural Outlook Forum

Owen Wagner - February 2017



International

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Context of the debate - diabesity

American adults continue to get fatter – encouragingly, obesity rates among children seem to have peaked

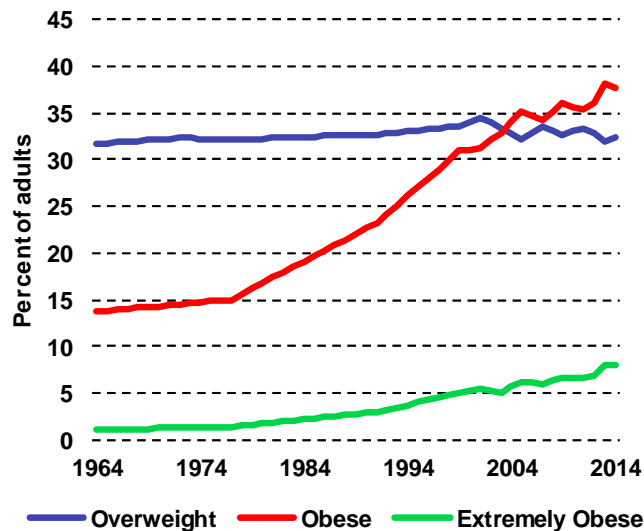
Data comes from NHANES survey.

Between 1960 and 2010, incidence of obesity in the US adult population increased from 13.5% to 37.5%. In children, the obesity rate increased from 3.5% to 17.4%.

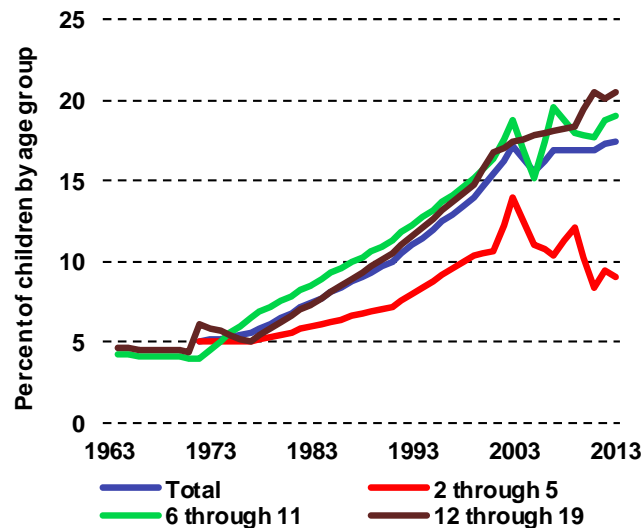
Meanwhile, the age-adjusted share of Americans living with diabetes increased from 3.5% in 1980 to 9.1% in 2014.

Trends across all three metrics have become more encouraging in recent years.

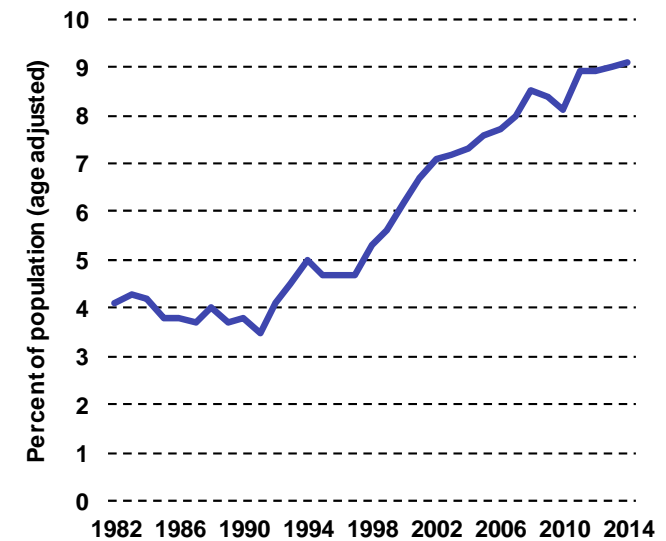
Obesity in US Adults



Obesity in US Children



Incidence of Diabetes



Source: NHANES and CDC data.

Context of the debate – access to healthy lifestyles

Demographics of obesity and issues of access to healthy lifestyles

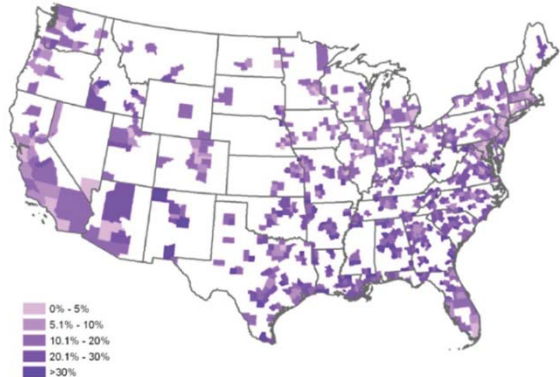
While measurements like obesity have many years of data behind them, the CDC only recently began tracking physical activity. Data tells us what we already know – children aren't getting enough exercise.

Increasingly, the debate surrounding obesity and related diseases is being cast in terms of access to healthy lifestyles.

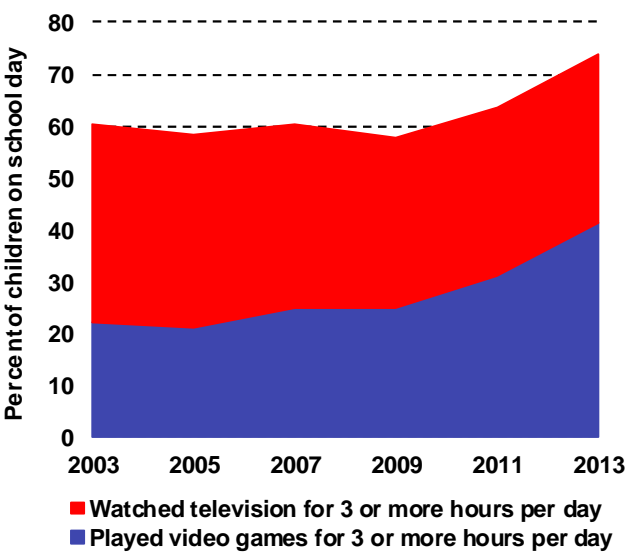
Rates of obesity are generally higher in fast-growing, minority populations.

Urban food deserts

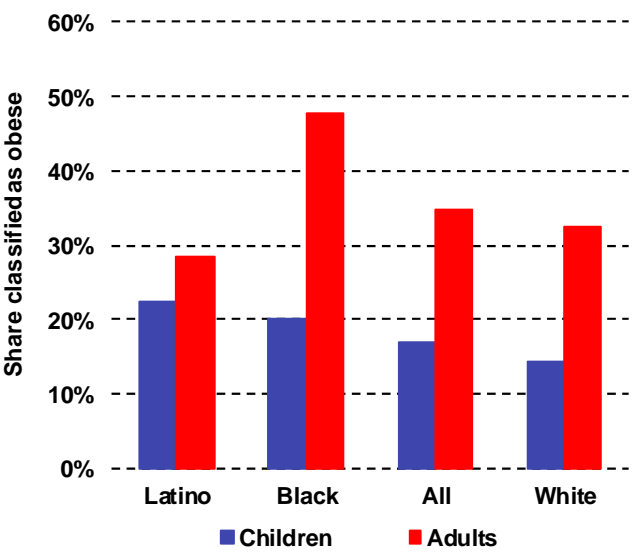
Percent of Metro County Population that is Low Income and > 1 Mile from a Supermarket



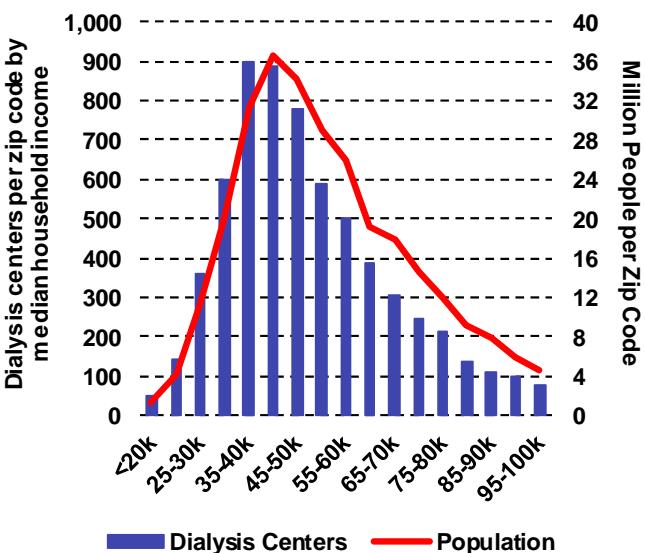
Sedentary behavior in children



In adults and children across different races



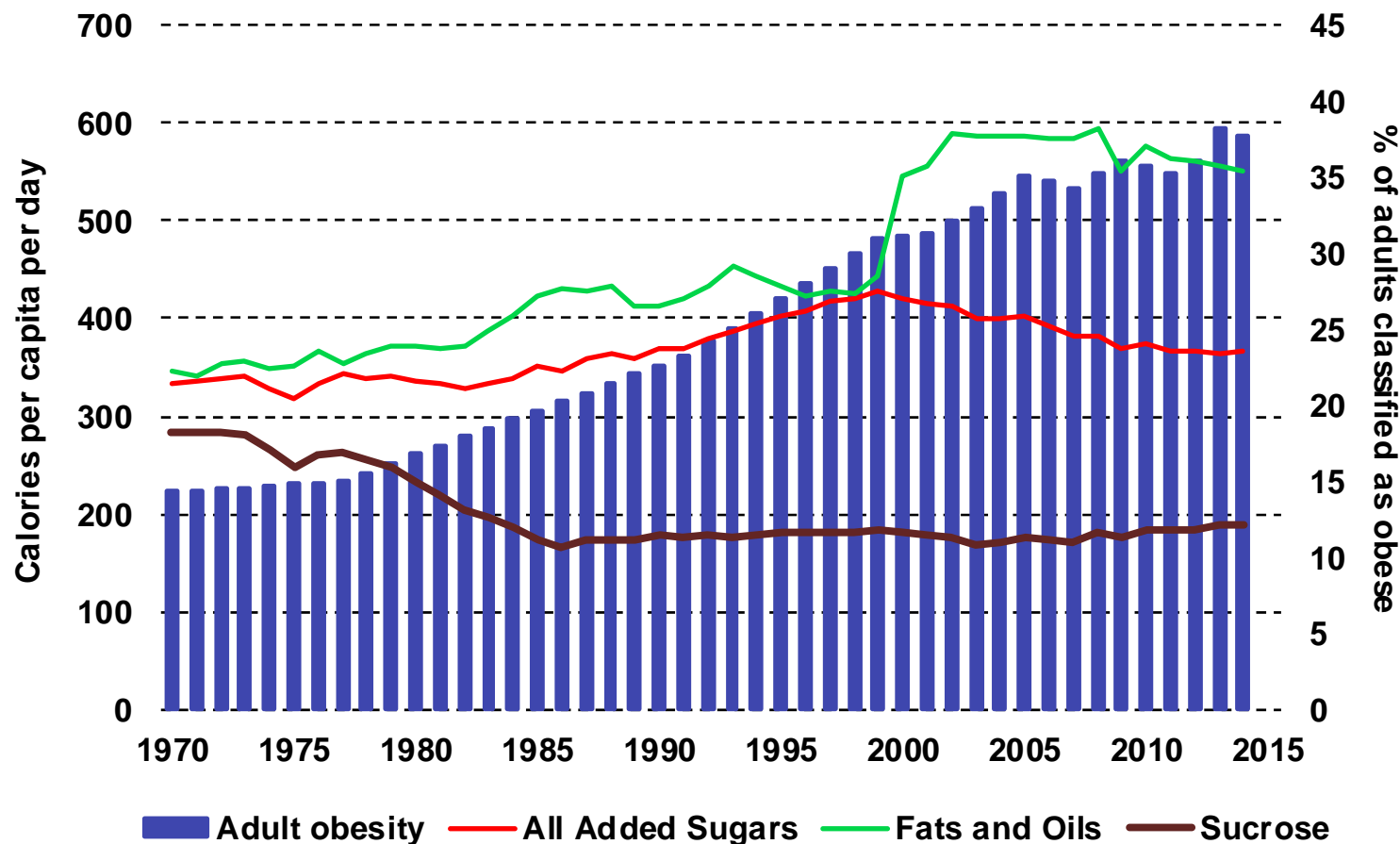
Over-representation of dialysis centers in poor zip codes



Source: USDA, NHANES and CDC data.

Is the role of added sugars overstated?

Incidence of obesity among adults and calorie consumption among select categories



Over the last forty years, the incidence of obesity has increased upwards of 150%.

Caloric intake from added sugars has increased 9% during this timeframe.

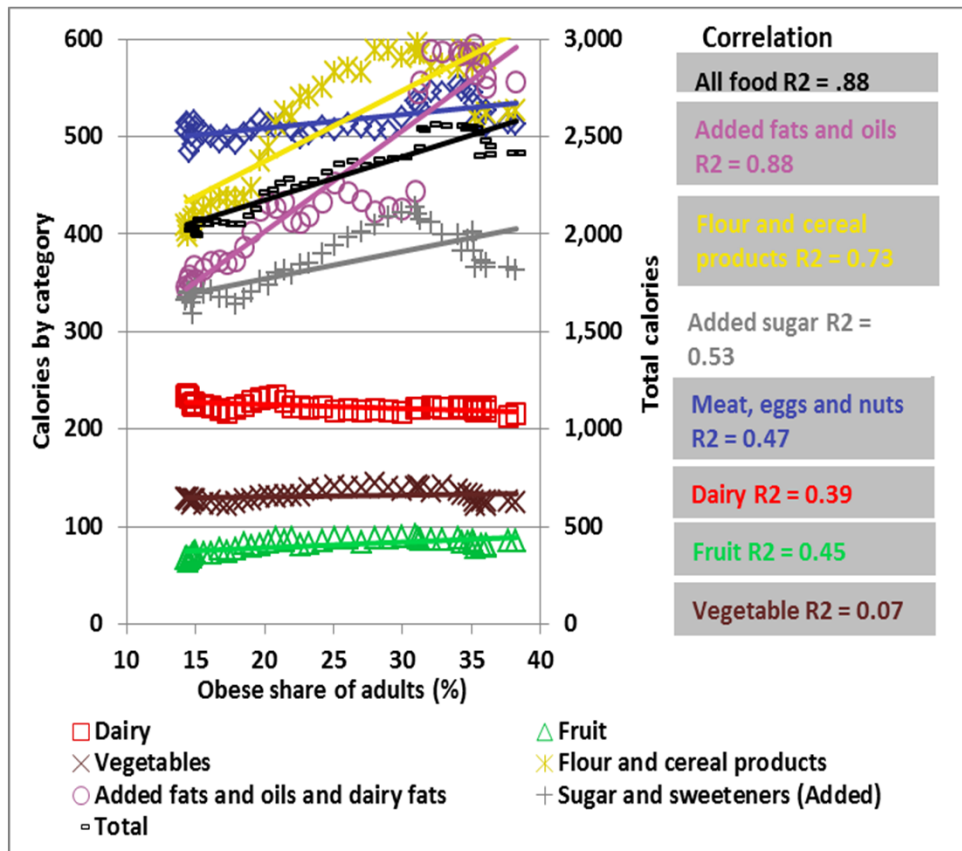
For the cereals and added fats categories, caloric intake has increased 29% and 67%, respectively, over the same time period.

Over the last decade, caloric intake from sweeteners has decreased by 13%, even as the incidence of adult obesity has increased by 16%.

Other factors are clearly at play.

Is the role of added sugars overstated?

Correlation between adult incidence of obesity and caloric intake by major food category



The correlation between total calories consumed and obesity is higher than the correlation between obesity and any specific food category. However, the correlation isn't perfect, and lack of physical activity is clearly a factor.

Not surprisingly, among specific food categories, caloric intake through fruits and vegetables have the lowest correlation with obesity.

Caloric intake through added fats and cereal products, both have a higher correlation with obesity than added sugars.

The power of USDA in influencing consumption patterns

USDA/DHHS dietary guidelines influence consumption patterns in a number of ways

Old vs. New Nutrition Facts label

Nutrition Facts

Serving Size 2/3 cup (55g)
Servings Per Container About 8

Amount Per Serving

Calories 230 **Calories from Fat** 72

% Daily Value*

Total Fat 8g **12%**

Saturated Fat 1g **5%**

Trans Fat 0g

Cholesterol 0mg **0%**

Sodium 160mg **7%**

Total Carbohydrate 37g **12%**

Dietary Fiber 4g **16%**

Sugars 1g

Protein 3g

Vitamin A 10%

Vitamin C 8%

Calcium 20%

Iron 45%

* Percent Daily Values are based on a 2,000 calorie diet.
Your daily value may be higher or lower depending on
your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Nutrition Facts

8 servings per container

Serving size **2/3 cup (55g)**

Amount per serving

Calories **230**

% Daily Value*

Total Fat 8g **10%**

Saturated Fat 1g **5%**

Trans Fat 0g

Cholesterol 0mg **0%**

Sodium 160mg **7%**

Total Carbohydrate 37g **13%**

Dietary Fiber 4g **14%**

Total Sugars 12g

Includes 10g Added Sugars **20%**

Protein 3g

Vitamin D 2mcg 10%

Calcium 260mg 20%

Iron 8mg 45%

Potassium 235mg 6%

* The % Daily Value (DV) tells you how much a nutrient in
a serving of food contributes to a daily diet. 2,000 calories
a day is used for general nutrition advice.

Nutrition Facts	
8 servings per container	
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Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	
Calcium 260mg	10%
Iron 8mg	20%
Potassium 235mg	45%
6%	
* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

The first Dietary Guidelines for Americans (DGA) were released in 1980 and since then have been reviewed, updated and published every five years. Through these guidelines the USDA and DHHS influence consumption patterns through:

- soft power – nutrition labels may sway consumer choice, and ingredients used by manufacturers.
- hard power – DGA's can, to a limited extent, dictate the foods eligible for federal nutrition programs.

2015 DGAs call for limiting intake of added sugars to 10% of caloric intake, which is in line with WHO recommendation. This 2015 iteration is less severe, but certainly more explicit than the 2010 guidelines, which called for capping SoFAS at 5-15% of total caloric intake.

Following 2015 guidelines would amount to a drop of 19% (calories unchanged) to 33% (recommended calories) in per-capita consumption of added sugars.

The power of USDA dietary guidelines – nutrition programs

Federal nutrition programs – budget and beneficiaries

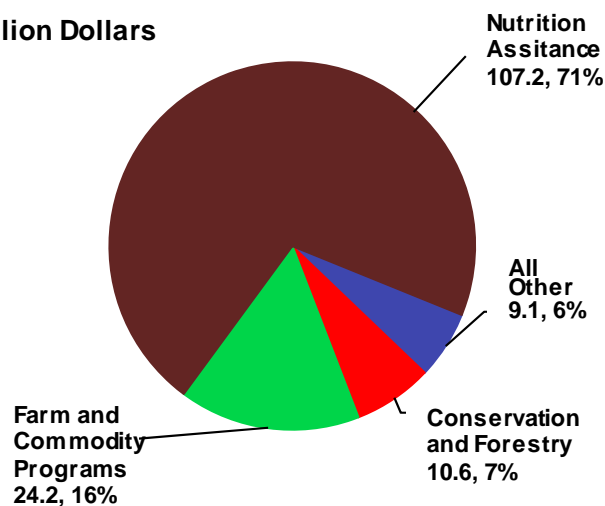
Size and expenditures of USDA's nutrition programs surged over the course of the great recession. For 2016/17, USDA's nutrition assistance programs will exceed \$107 billion, or 71% of the departmental budget.

The number of beneficiaries of nutrition programs has been trending slightly downward from a 2012 peak over the past four years. Nonetheless, more than 45 million or 1 in 7 Americans still rely on these programs.

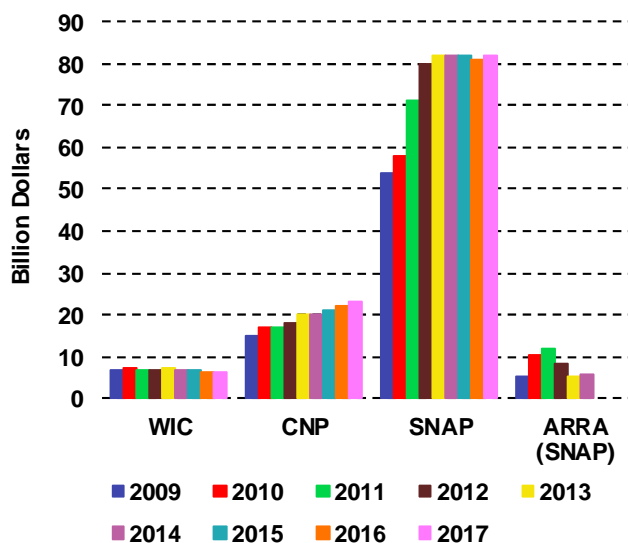
WIC=Women, Infants, Children / CNP=School meals / SNAP = Food stamps

Nutrition programs as a share of 16/17 USDA budget

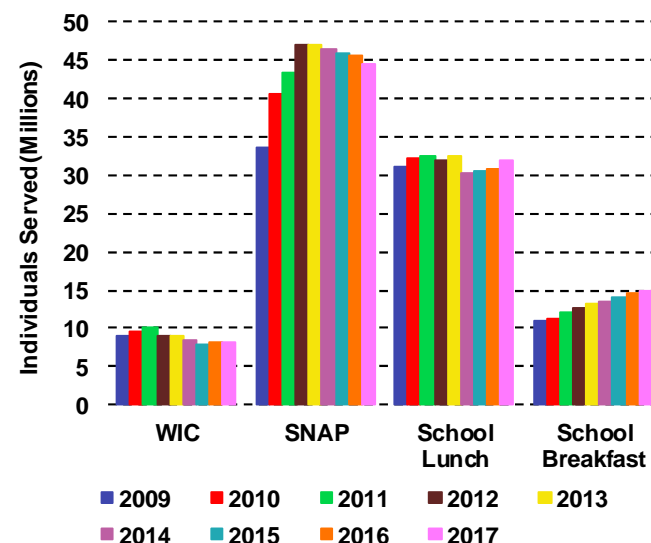
Billion Dollars



USDA spending on nutrition programs



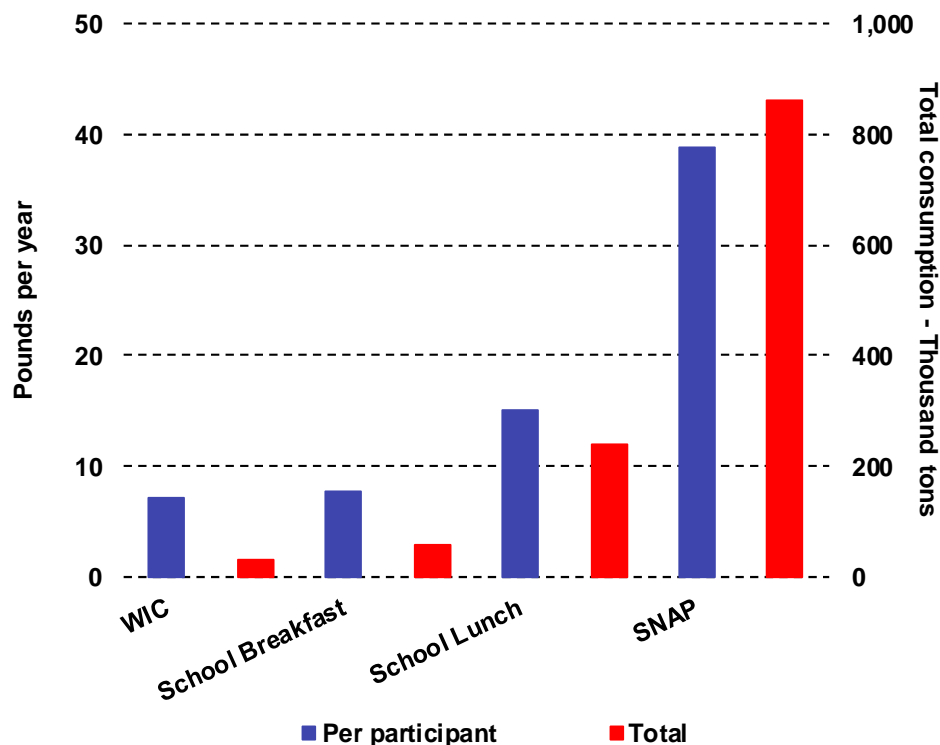
Beneficiaries of USDA nutrition programs



The power of USDA dietary guidelines – nutrition programs

Estimating sugar purchases underwritten by USDA nutrition programs

Sugar purchases by federal program



Program estimates are based on a function of eligible foods and expenditures.

WIC is the smallest and most restrictive of the three nutrition programs. Per capita sugar benefit \approx 7 lbs. per sugar per year, roughly 29,000 tons in total.

Guidelines exist for CNP but consumption patterns resemble those of the country at large. Per capita sugar benefit \approx 22 lbs. per sugar per year (for breakfast and lunch), roughly 300,000 tons in total. Government underwrites approx. 90% of these purchases.

SNAP is the largest and least restrictive of the three programs. No restrictions on food eligibility aside from alcohol and prepared meals. Per capita sugar benefit \approx 39 lbs. per sugar per year, roughly 860,000 tons in total.

Collectively, these programs account for roughly 10% of U.S. consumption.

The power of USDA dietary guidelines – end user response

Most food and drink companies have fought the recent revisions to dietary guidelines – all have been adapting their strategies

Interestingly, Mars and Hershey's have taken a very different tack:

In 2015, Hershey's revenues declined for the first time in a decade. Signaling a pivot away from candy, the company spent \$35 million to acquire Krave – a maker of high-end beef jerky.

In 2008, Mars was the first large candy company to adopt the “facts up front labels” – Hershey's by contrast didn't adopt these labels until 2013. In 2012, Mars stopped production of its king-sized bars, collateral damage from its self-imposed 250 calorie limit – Hershey still sells these products. In 2016, Mars came out in favor of the WHO guidelines on added sugars. And recently, they have suggested they may pull their candy from McDonald's “flurry” products.

Many other food companies have been quietly reformulating

Some substitution to high intensity sweeteners during spate of high prices. More recently, the name of the game has been reduction of added sugars. GM and Kellogg's have both reduced sugar content of kid's cereals by 15%. GM cut sugar content of Yoplait by 25%. Nestle reduced added sugar content by 4.1% in 2015, on its way to its 10% objective.

Soft drink companies have long seen the writing on the wall and have been snapping up juice/water/energy drink lines accordingly

Outsized importance of local legislation

Local jurisdiction have been angling to reduce soft drink consumption through restrictions on food stamp use and through taxes

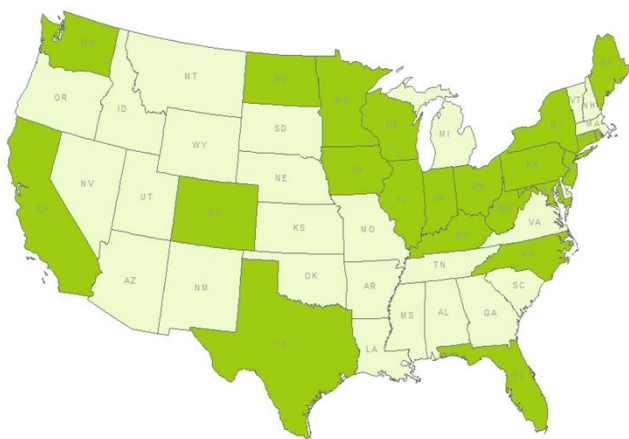
USDA has denied Minnesota’s (2004) and New York City’s (2011) request to ban soft drink and/or sugary snack purchases with food stamps. In saga spanning from Nov. 2015, Maine’s LePage will request a waiver now that Trump is in office.

States have long applied additional sales taxes to soda but consumers don’t see this on the advertised price and most are unaware they are even paying an extra tax, making this questionable as a means of reducing consumption.

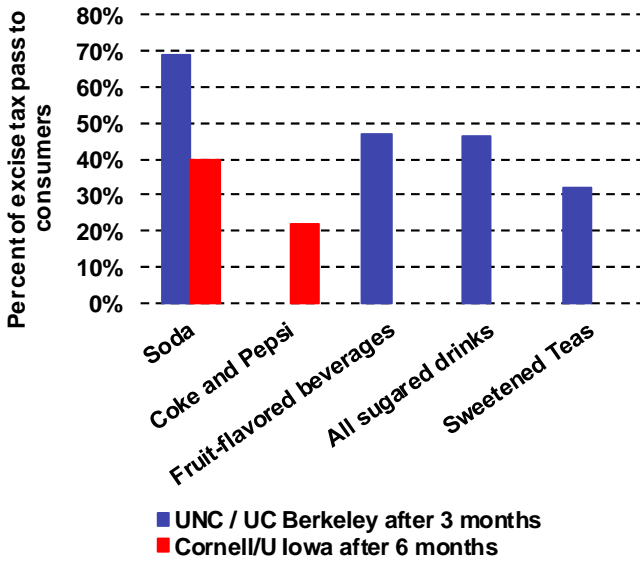
Instead, what is being pursued now, in some jurisdictions, is an excise tax strategy. When done on a limited geographic scale, retailers can be under pressure not to pass all the tax along to consumers.

When implemented nationally however, these taxes do impact consumption.

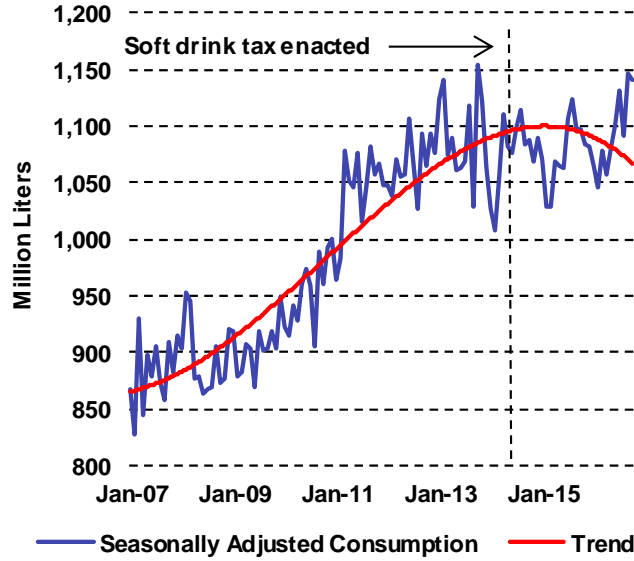
States with additional sales tax on soda



Estimates of excise tax “pass-through” in Berkeley, CA



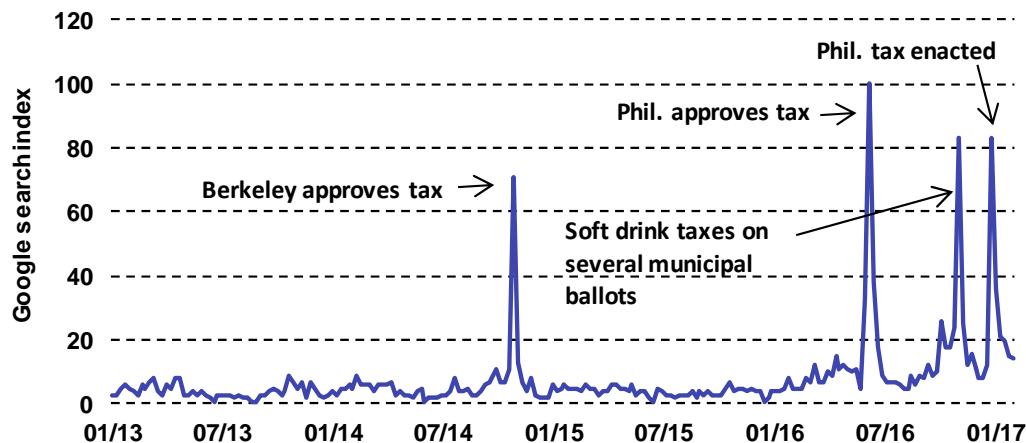
Mexican cola consumption (INEGI)



Outsized importance of local legislation

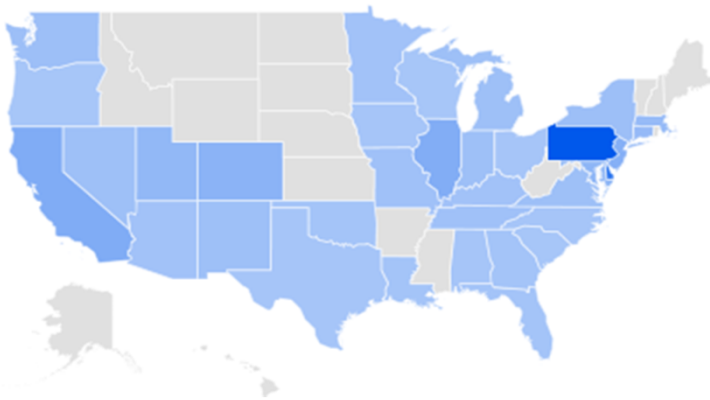
Google Analytics – US interest over time

“Soda Tax” (2/12-2/17)



Google Analytics - Interest by sub-region

“Soda Tax” (2/12-2/17)



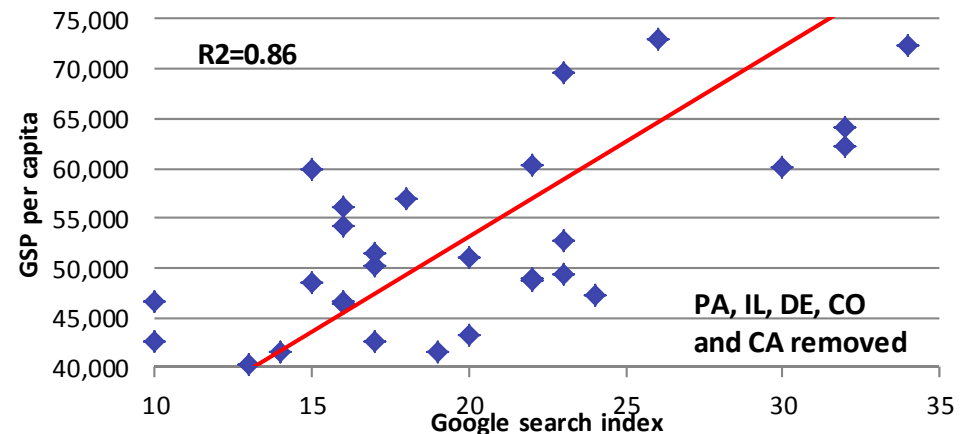
Source: Google Analytics.

Something about the Philadelphia tax feels different

- 1.5 c/oz. double the price on certain bulk purchases and can make soft drinks pricier than beer in some instances.
- Includes diet drinks.
- Less of a car culture than Berkeley, Philadelphians won't be able to avoid this tax as easily.
- Merchants comparing sudden drop-off in sales with cigarettes in wake of Master Settlement and '09 tax hikes.

Google Analytics - Interest by sub-region

“Soda Tax” (2/12-2/17) correl. with state incomes



What do consumers think, really?

How much time does the average American consumer spend pondering the following questions:

More caloric sweetener vs. less caloric sweetener?

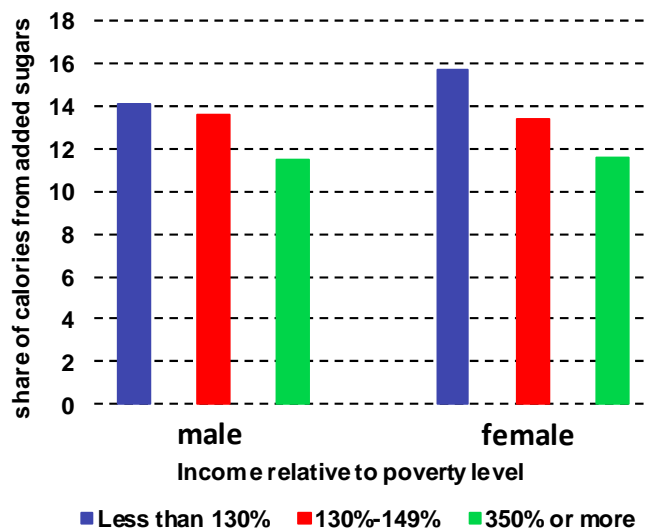
Sugar or corn syrup?

GM beet sugar or non-GM cane sugar?

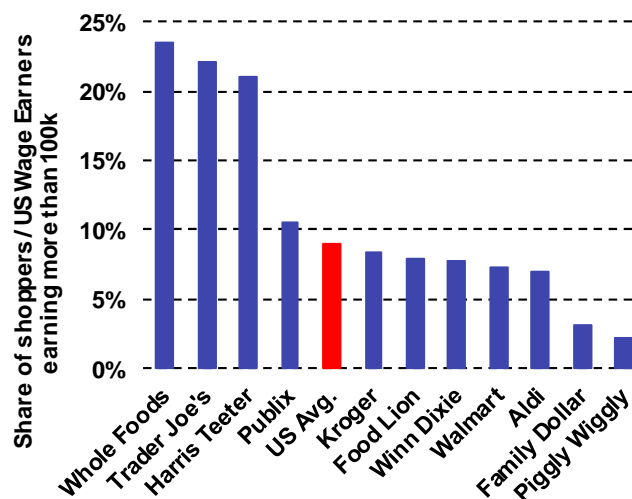
Probably less than the average USDA Outlook Conference attendee

Price, is a very important consideration and excise taxes may ultimately prove effective. Attitudes toward soft drinks have also clearly changed.

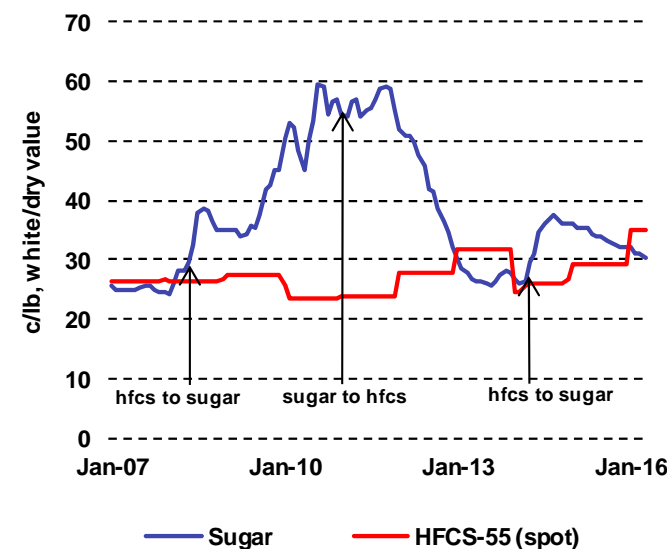
Sugar consumption and poverty (CDC)



Share of high-income of shoppers at select grocery chains



Sweetener prices and switching in Capri Sun



What do consumers think, really?

Vermont may not be the best barometer for where consumer sentiment is headed

In May 2014, Vermont passed a “no strings attached” bill (outcome of similar legislation in other states was irrelevant) requiring any product made with GM ingredients to be labelled as such. Federal legislation overturning this law went into effect July 1st, 2016.

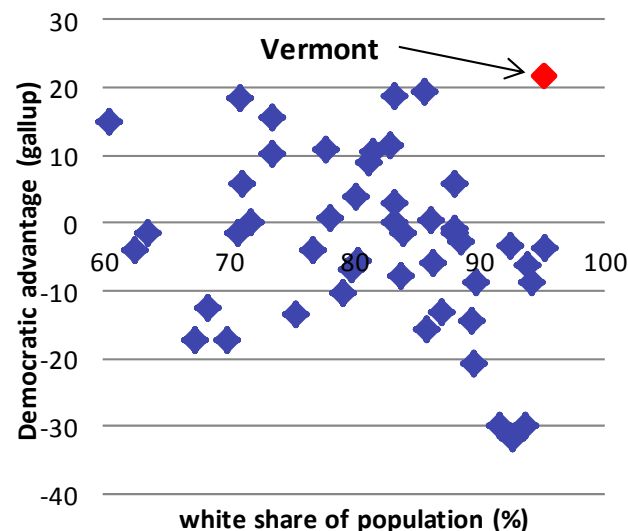
Vermont accounts for just 0.2% of the US population. Being the whitest, the “bluest” (Gallup 2016) and, the second oldest, it is also not particularly representative of the US as a whole.

In providing special exemptions for key industries the state’s idealism was matched by its pragmatism. GE rennet and GE brewing materials were exempted.

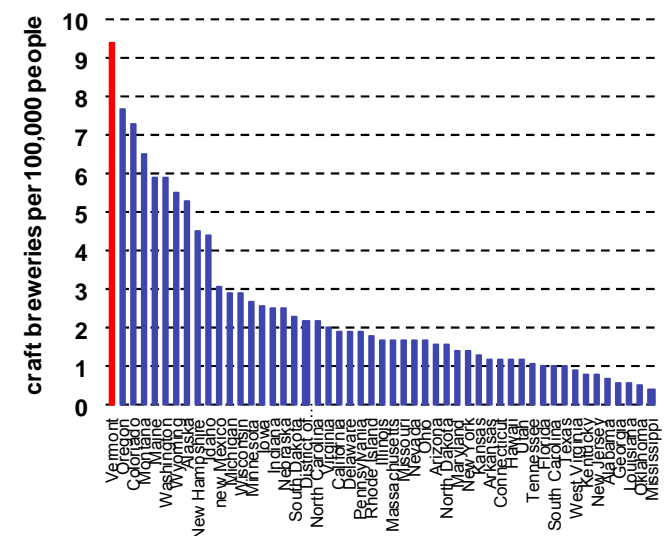
Vermont’s Jr. Senator



Racial and political makeup of US states



Craft breweries per-capita



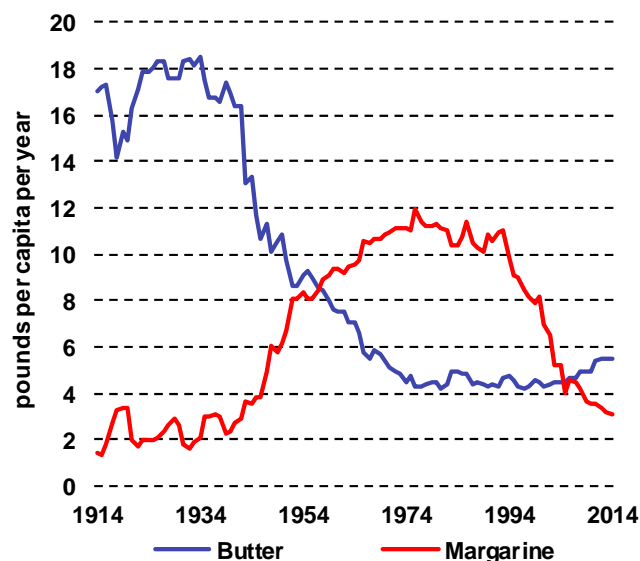
Implications for US sweetener industry

It may be hard to imagine dramatic changes in consumption levels for sugar, but we have seen it happen with other staples in the past.

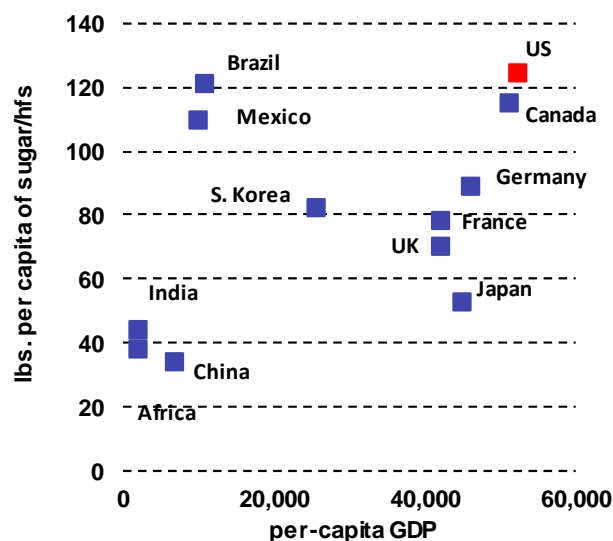
Calling sugar the “new tobacco” is unfair but tobacco does tell us that taxes and higher costs do curb consumption.

US didn't always have such a sweet tooth and there is no reason to rule out US sweetener consumption falling in line with levels more consistent with other developed countries.

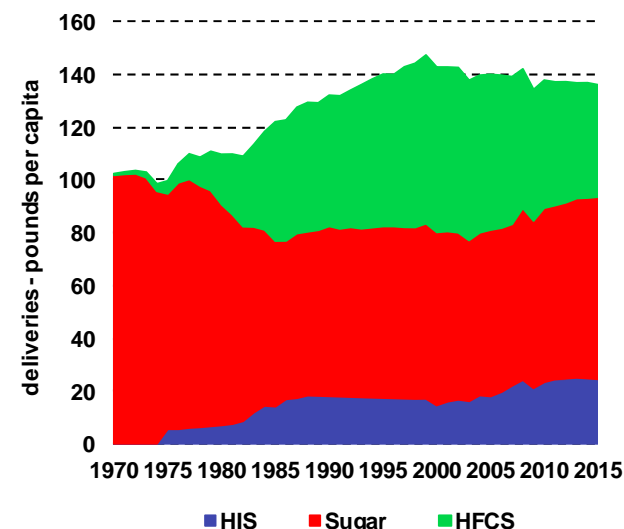
Declining consumption of butter and margarine



Caloric sweetener consumption in select countries



US sweetener consumption over time



Implications for US sweetener industry

Caloric sweetener consumption patterns more in line with other developed countries or USDA Dietary Guidelines, would put the industry and the sugar program under substantial pressure

Changes to industry by 2030 at various levels of consumption

If per-capita caloric consumption were at levels of:	Corresponding Percent Change in caloric sweetener	Implied Per-Capita Sugar Consumption (lbs) 1/	Change in demand at 2030 ('000 tons)	Equivalent to:
Current US	0.0%	69.1	+238	Near maximum beet capacity utilization
Canada	-7.7%	63.8	-710	Loss of Great Lakes Production
Germany	-28.5%	49.4	-3,300	Loss of all imports
Dietary Guidelines	-33.0%	46.3	-3,852	Loss of entire domestic cane sugar production
France	-37.4%	43.3	-4,391	
UK	-43.6%	39.0	-5,160	Loss of entire domestic beet sugar production
Japan	-57.4%	29.4	-6,874	Nearly all of US cane refining capacity

Declining caloric sweetener demand has already spurred consolidation among US HFCS producers.

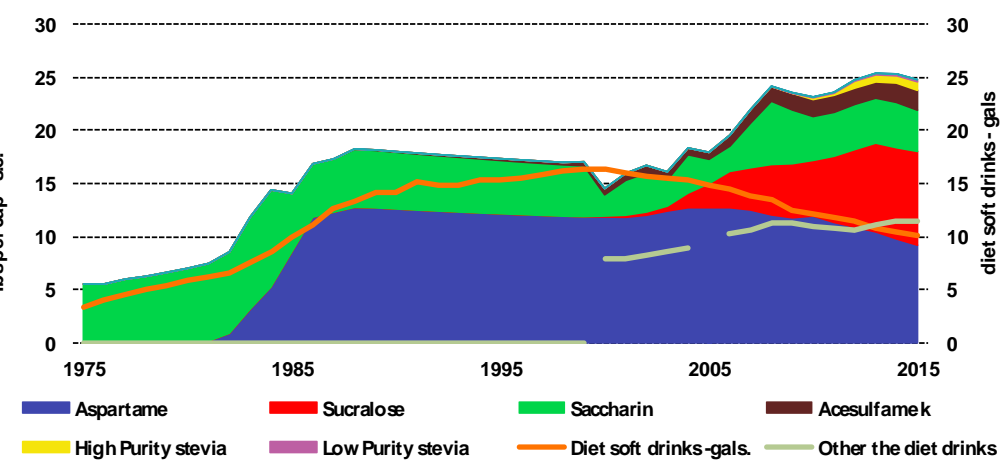
Current sugar demand is not sufficient for all US market stakeholders (domestic + TRQ + Mexico).

Even modest reductions in US sugar demand could lead to closure of more facilities, potentially weakening political support for the sugar program.

1/ These numbers are not the levels of per-capita sugar consumption in the corresponding countries. Rather they are the US number if total caloric sweetener consumption in the US were to fall to the level of the corresponding country while maintaining the split (in percentage terms), between sugar and HFCS that the US had in 2016.

Could high intensity sweeteners fill this void?

Per-capita consumption of HIS and diet soft drinks



HIS would probably fare better than recent overall (i.e. flat) consumption trends suggest

- Declining use in beverages belies recent successes in food use

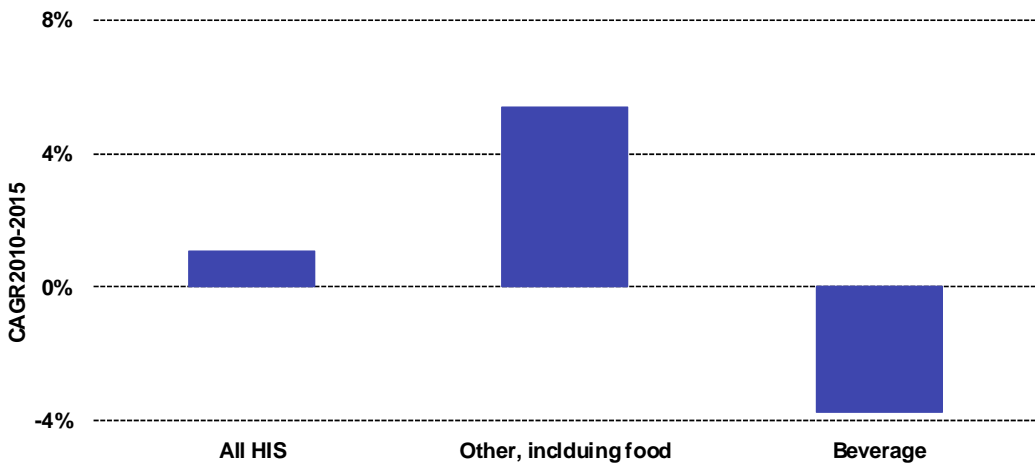
New ways of using sugar could also fill the void

- Nestlé’s “structured” sugar

Alternatively, much of the void could simply go unfulfilled

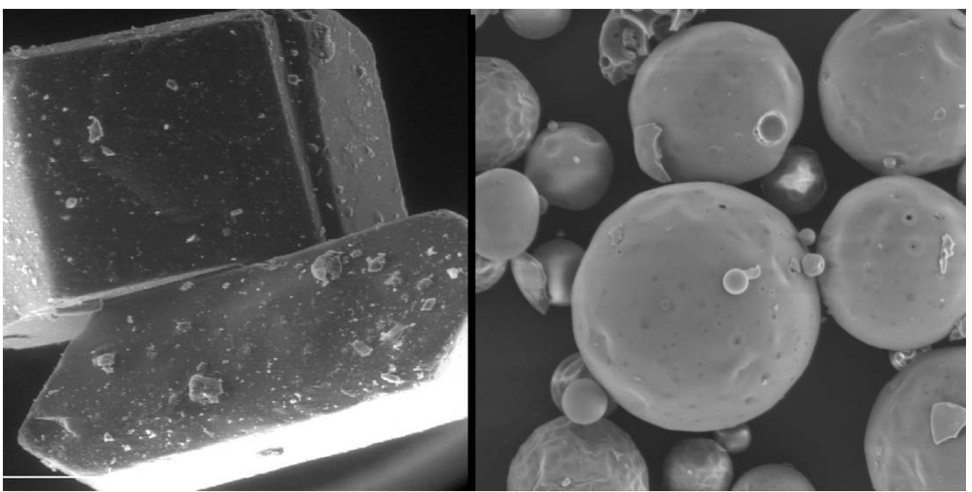
- Tastes change / become more in line with other developed countries or America of 40 years ago

Recent per-capita consumption trends in HIS by end-use



Source: Nestle

Sugar (L) and Nestlé’s “structured” sugar (R)



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