



**Rabobank**

# Talking Points: The War on Sugars

## A Bittersweet Success Story

### RaboResearch

Food & Agribusiness  
far.rabobank.com

### Nicholas Fereday

Executive Director  
+1 347 215 4158

#### Contents

1. Let's Start With the Data – The 'Availability' of Sugars Is Down One-Fifth	1	3. Obesity Is Complex, There Is No Sugar-Coated Silver Bullet	4
2. The War on Sugars – Mission Accomplished?	2	4. Now What? – Carry on Regardless?	5

## Summary

This month, let's talk about sugars, specifically caloric sweetener demand in the US, and ponder why it is that, although consumption has fallen by about one-fifth this century, our waistlines do not appear to have gotten the memo? What's up with that?

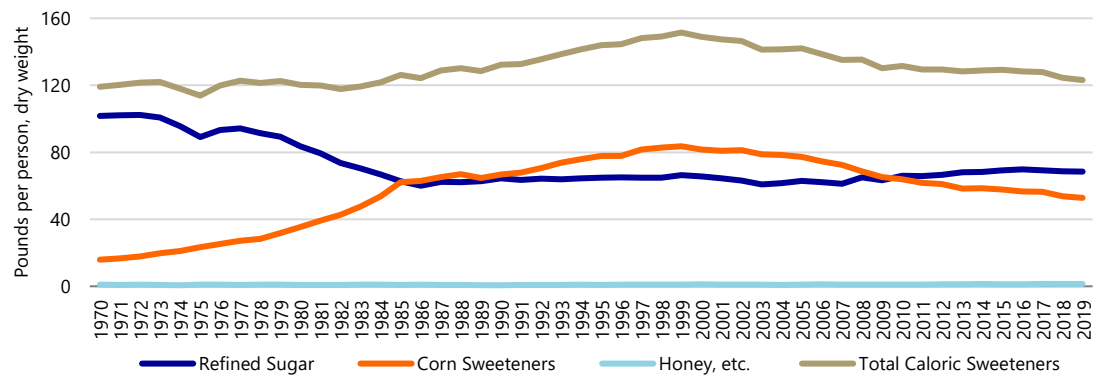
1. Let's Start With the Data – The 'Availability' of Sugars Is Down One-Fifth.
2. The War on Sugars – Mission Accomplished?
3. Obesity Is Complex, There Is No Sugar-Coated Silver Bullet.
4. Now What? – Carry on Regardless?

## 1. Let's Start With the Data – The 'Availability' of Sugars Is Down One-Fifth

According to the latest data from the US Department of Agriculture (see below), over the past twenty years (1999-2019), the availability for consumption of caloric sweeteners (aka sugars) was 19% lower than its 1999 peak. We now consume the equivalent of about 123lbs of added sugars each year. That's not just from the bags of sugar we buy in supermarkets but also from all those packaged foods and beverages we consume (about 60% of packaged foods and beverages contain some form of added sugar). Although this still sounds rather a lot, over 13,000 teaspoons! it is actually almost 30lbs less than what we consumed back in 1999.

Breaking this down, the decline was primarily attributable to a 37% drop in the consumption of corn sweeteners such as glucose and dextrose (both fell by about 20%), and, of course, high fructose corn Syrup (HFCS) which fell by a stunning 42%. This tremendous reduction is at the heart of the story here as consumers drank fewer caloric sodas (HFCS is primarily used as a sweetener in beverages, and volumes in the regular soda market have been declining at about 2% per year for the past 16 years). This more than offset the 3% per capita rise (in total, not per year) in refined sugar (cane and beet sugar) demand over the same period. Refined sugar had a bit of a growth spurt around 2010, but that appears to have tapered off. By 2019, refined sugar demand was almost one-third higher than corn sweetener demand, whereas in 1999 it was a fifth lower. Even the overall caloric sweetener market declined over this period by about 4% (as the 26% drop in corn sweetener demand more than offset the 21% rise in refined sugar), despite the US population rising by about 18%.

Figure 1: US per capita caloric sweetener availability, 1970-2019



Source: USDA, Rabobank 2021

The ‘availability for consumption’ datasets maintained by the USDA can only ever serve as ‘proxies for consumption at the national level’ and remain the only consistent source of time series data on US food availability we have to play with. These estimates are calculated by taking into account the supply of the relevant commodities from production, trade, stocks and then taking out non-food uses. In the case of sugars, they do not factor in the trade in sugar-containing products such as cookies and candy that flow across the borders. Based on conversations with industry experts, an estimate of a net addition of about 600,000 metric tons/year sugar equivalence seems in order. But there is little evidence to support any major changes in the net impact over the period we are interested in here. Let’s not forget, US sugar policy is all about protecting the market for domestic producers and designed to deter anything that threatens domestic production. Neither has there been a compensatory increase in say intense sweeteners (though that market is growing), or ‘natural’ sweeteners such as honey (consumption is up 25% over this period but that translates to just an extra 0.2lbs per capita), or even indirectly from fresh fruit (yes, we are eating more berries) to fully plug the drop in caloric sweetener consumption. To sum up, according to this data set, this century, on a per capita basis, our consumption of caloric sweeteners is trending downwards.

## 2. The War on Sugars – Mission Accomplished?

At face value this downward trend should not really come as too much of a surprise, given the consistent messaging to reduce our sugar intake from well, everyone really. Our dentists have drilled into us the perils of indulging our sweet tooth given the uncontroversial fact that excess sugar consumption leads to tooth decay. But numerous studies over the years have opened up other lines of attack, collectively raising concerns over the negative health effects of excessive caloric sweetener consumption. For example, in reviewing the scientific literature, the UK Scientific Advisory Committee on Nutrition found evidence that the higher the proportion of sugar in the diet, the greater the risk of high energy intake, which can lead to weight gain (that in turn increases the risk of other health issues such as diabetes and heart disease). After reviewing over 300,000 publications, the European Food Safety Authority put it more bluntly, “based on the risk of developing chronic metabolic diseases and dental caries, the intake of added and free sugars should be as low as possible.” We have also learnt in parallel about how sugar acts like kryptonite. We humans are predisposed and seemingly powerless to resist its charms (especially when combined with fat.)

As a result, advice to cut back on caloric sweeteners, such as sugar and HFCS, has become a common and increasingly stronger recommendation in national and international dietary guidelines. Starting with Mexico in 2014, over 40 countries (and many individual states and local ordinances) and counting, have gone a step further with taxes on sugar-containing products, such as soda, in an attempt to deter consumption and encourage reformulation. Other measures adopted include labelling requirements, advertising restrictions, as well as arm-twisting food companies to make voluntary reductions and reformulations. Food companies too have

recognized that consumers want less sugar, and that new or reformulated products labelled with 'no added sugar' are a selling point (and in some cases, a cost saving). This is not a new trend. Back in 2017, my colleague Andy Duff and I discussed in the report, "[Sweetness and Lite](#)", the acceleration of the consumer shift away from sugar – "for many consumers who follow today's health and wellness trends with respect to weight management, calorie reduction has become synonymous with sugar reduction." And in response, food & beverage companies, eager to cater to their consumers' wishes, have followed through a range of strategies including reformulation and changing product sizes. Even proponents who view the 'calories-in-calories-out' energy balance model as being too simplistic, and suggest alternatives paradigms such as the carbohydrate-insulin model, still point the finger at carbohydrates (and insulin), concluding we need to avoid sugars.

The other factor here has been the role of social media in shaping consumer perceptions of caloric sweeteners, especially HFCS. This isn't the place to go too deep (or get too distracted) but I've made some points in Box 1. To recap, the combination and reinforcing behavior of feedback loops created by the emerging science, all the government-led initiatives, the food industry offering up solutions, changing consumer preferences, coupled with the online onslaught described in Box 1, has paid off.

This considerable decline in per capita consumption (recall, HFCS consumption is down 42%) should, on balance, be something to celebrate, a public health success story. Doubly so as my colleagues tell me declining sugar consumption seems to be a common trend in many developed markets and looks set to continue. Mission accomplished, surely?

### **Box 1: HFCS – Social Media's First Scapegoat?**

Let's put HFCS in the psychiatrist's chair and have a little empathy for this most maligned of sweeteners. The case history reads: consumed for over three decades with little fanfare until an academic paper in the American Journal of Clinical Nutrition in 2004, timidly suggested, "The increase in consumption of HFCS has a temporal relation to the epidemic of obesity, and the overconsumption of HFCS in calorically-sweetened beverages may play a role in the epidemic of obesity."

Although the authors only raised the possibility of a connection, such subtleties and caution were generally ignored in the considerable interest the article generated and possibly resulted in HFCS becoming the first victim of 'modern activism' on the nascent social media platforms (Facebook was founded in 2004, YouTube in 2005, and Twitter in 2006). I don't want to also fall into the trap of spurious correlations, but as someone who witnessed what happened, it is not unfair to say the media's interpretation was not a good look for HFCS: "It should be banned from our food supply," "It has no redeeming value," "It is POISON!" and my personal favorite, "the Devil's candy."

Although the language has since been toned down, the perception of HFCS as being uniquely bad for you and therefore to be avoided has stuck with consumers and the media. It is not hard to find recent articles with variations of, "The addition of high fructose corn syrup to our foods has led to a dramatic increase in obesity rates." As the Washington Post remarked a couple of years back during the Superbowl's Corn-gate, "Corn syrup and high-fructose corn syrup have become nutritional boogeymen." This is despite leading academics long ruling out such villainy. Back in 2006, the NYT quoted Dr. Walter Willett, Chairman of the nutrition department of the Harvard School of Public Health as saying, "There's no substantial evidence to support the idea that high-fructose corn syrup is somehow responsible for obesity. If there was no high-fructose corn syrup, I don't think we would see a change in anything important."

For their part, the corn wet milling industry long gave up trying to set the record straight on this natural plant-based sweetener and has suffered through a painful period of contraction, consolidation, and plant closures. Where possible, companies have raised their exports of HFCS but largely they have focused on transitioning out of HFCS into other (non-sweet) value-added starch products. It is quite symbolic to note that the domain name for the “Sweet Surprise” website used by the Corn Refiners Association to make the case to consumers for HFCS is currently up for sale.

### 3. Obesity Is Complex, There Is No Sugar-Coated Silver Bullet

But here’s the thing, despite the reduction in per capita sugar consumption, there does not appear to have been any impact on our collective waistlines. As the Scientific Report of the 2020 Dietary Guidelines Advisory Committee noted in July 2020, “More than 70 percent of Americans have overweight or obesity, and the prevalence of severe obesity has increased over the past two decades.” The suggested causal relationship of rising HFCS consumption with rising obesity in the 1980s and 90s (discussed in Box 1) has been replaced with one of declining HFCS consumption and (based on the last two CDC (Centers for Disease Control and Prevention) National Health surveys), an accelerating rate of incidence of obesity. According to the CDC, the US obesity prevalence was 42.4% in 2017-18 and there were no significant differences between men and women among all adults or by age group. The situation was similar for children and adolescents too. The prevalence of childhood obesity rose to 19.3% in 2017-18, compared to 18.5% in 2015-16, and 17.2% in 2013-14.

Recognizing the pitfalls in extrapolating such aggregate data onto individuals, we need to be careful in drawing conclusions here. The USDA data on sugar availability is not based on direct observations but is an aggregation at the national level. The data says nothing about what is going on within States, or in demographic or socioeconomic groupings. At the individual level, all-other-things-being-equal, one would expect a one-fifth cut in sugar calories to have an impact. And so (being fallible) I cannot help thinking that if we cut sugars (primarily HFCS) and it made no difference then what are we eating more of? Or are we just moving less? Or wasting more food? Or all three? My colleague Cyrille Filott also reminds me to consider nutrition inequality – “A group of the population may be obese (and a growing group to boot), however perhaps another group is trying to live healthier by cutting out sugars. So total consumption might be down because of one part of the population?” Googling revealed one first of its kind [systematic review](#) and meta-analysis of changes in consumption of added sugars in 13-30 year olds from 2017, but struggled to find significant results where “pooled estimates of change in intake per year are small... but if maintained through the adolescence and early adulthood years will make a positive contribution towards a more healthy diet.” We are not nutritionists and look to others more qualified to provide insights here.

Perhaps, all we can safely conclude or remind ourselves here is that obesity is [complicated](#) and maybe scapegoating sugars is the latest example of what happens when we oversimplify an issue. We’ve been here before and such generalizations have led us down some dubious paths in search of a healthier diet by demonizing one ingredient and, by implication, encouraging consumption of another or by creating as a BMJ article once argued “nutritional halos” around themes such as low fat, more protein, etc. By zeroing in on one aspect of our diet we miss the bigger messier picture around the importance of considering food systems, dietary patterns including the social determinants of health. The independent review for a new UK food strategy reminds us of this – “no country has successfully reversed the drift towards obesity. While some interventions are more effective than others, there is no single silver bullet.”

## 4. Now What? – Carry on Regardless?

It is not being cynical to argue that we do not expect a reckoning here, where lightbulbs go off and mainstream consumers become disillusioned with sugar reduction as a leading strategy for weight management. The data, with all limitations we have discussed, has been around for a while and is pretty well-known within the industry. Nor are we making the case to eat more sugar. Going forward, here are five points to consider:

### a) The momentum to reduce sugar will continue

Because sugar reduction is so well-entrenched as a 'healthy habit' for many consumers, it is hard to imagine any reversal of that in the short to medium term. For example, according to ADM, eight out of ten consumers are actively trying to reduce sugar in their diets. Only last month, Ingredion's Nat Yates commented in FoodNavigatorUSA how "consumer interest in cutting sugar" remained remarkably consistent. In the food media too, it remains a dominant narrative and is unlikely to change. It does not take much effort to find recent articles with variations of, "Excessive sugar consumption is impacting public health", that "Most of us know that too much sugar is bad for our health" or "Manufacturers are under increased pressure to cut the sweet stuff from food and drink products."

### b) Sugar reduction will remain a growth industry

It seems the old adage (whispered, never spoken out loud) that 'the more sugar you add, the more it sells' is no longer the case. We expect food companies to continue to hold off on the sugar, whether in response to legislation (to avoid taxes or labelling requirements) or in response to changing consumer preferences. Sugar reduction strategies now permeate through food company ESG targets, product reformulations (including portion sizes), new products, portfolio reviews including divestitures and acquisitions. Just this summer we witnessed:

- **Updated ESG targets.** Many large companies have doubled down on their commitment to reduce sugar. Nestlé, for example, had a target of cutting added sugars by 5% but recently announced they narrowly missed it, achieving 4.5%, and attributing the reformulation slowdown to Covid disruption. Also, in August, Mars released the third edition of the Mars Food Nutrition Criteria, laying down their food guidelines, including goals on sugar.
- **New products.** Over the summer, Conagra Brands launched keto-friendly plant-based frozen Healthy Choice Zero products with large front of pack "Zero Sugar Added" labels. And Clif Bar & Co. entered the ready-to-eat cereal category with products that have up to 40% less sugar than other cereal brands. Not to be outdone, Chobani appears to have gone one step further, taking out all the naturally-occurring milk sugars in its Chobani Zero (sugar) range of yogurts (but does add allulose, see below). For their part, beverage companies have been much quicker off the mark. PepsiCo launched its bubbly sparkling water brand back in 2018, and, last year, Coca Cola launched the Aha brand of sugar free drinks, the company's first new beverage brand in over a decade.
- **Divestitures.** Two examples will suffice. In July, bulk corn sweeteners fell off the menu at Tate & Lyle, when the company sold its low-growth North American primary products division to KPS Capital Partners. And in August, PepsiCo sold its controlling interest in its North American juice business, such as Tropicana and Naked, to PAI Partners on the back of declining sales largely attributed to changing consumer preferences "to reduce sugar" and "the ongoing concern about sugar." As CEO Ramon Laguarta said at the time, "clearly no-sugar is growing very fast, and I think we're well-positioned from the R&D point of view and the innovation point of view on non-sugar." We are witnessing the evolution of the juice industry from an everyday "good for you" breakfast staple to an affordable and permissible indulgence.

- **Acquisitions.** In June, Hershey completed its acquisition of the low-sugar chocolate company, Lily's, viewing the company as a good fit in their growing portfolio of "better for you" snacking brands. Back in February, Hershey invested in US-based sugar startup Bonumose, to help scale-up their patented production of reduced-calorie sugars, tagatose and allulose.

## C) Still hunting for the Holy Grail of sweeteners

As the Hershey's investment in Bonumose reminds us, the search for the Holy Grail continues (the mythical substance that tastes and acts like sugar, but with fewer calories and a not insurmountable cost difference). Despite setbacks in this search, "holes in the holiness" if you like, such as the failure to launch of Nestle's patented 'hollow' sugar in Milkybar Wowsomes in the UK in 2019, finding new ways and means to cut back on sugar will remain a growing industry. According to the March 2021 edition of LMC's glorious "Starch & Fermentation Analysis", in the global battle for our sweet tooth, demand for the so-called alternative sweeteners is outstripping the growth of sugar and now exceeds over 10% of the overall sweetener market (all 200m metric tons of it, in sugar equivalence). To back that up, my colleagues who track sugar assure me that, "the market for sugar substitutes should see increased growth, as a result of the recent trend towards reduction of sugar use in beverages and food products." Here are five recent stories. I could have easily mentioned another ten:

1. As already mentioned, allulose's start is still rising, especially as the very low-calorie sweetener (just 10% of the calories of sugar) does not have to appear on the added sugar line in a product's Nutrition Facts label.
2. The latest version of stevia. There always seems to be another stevia glycoside to hawk. Where Rebaudioside (Reb)-A was once the talk of the town, excitement has now moved on to Reb-M, including Amyris's RealSweet, where the substrate is not stevia but fermented sugarcane. Reb-N, from companies such as Sweegen in California, is also waiting in the wings.
3. BetterJuice, an Israeli startup, that is working on sugar reduction solutions in fruit juices, has partnered up with GEA Group AG, in Germany to help scale up faster.
4. Biotech company, Evolva out of Switzerland, has launched a fermented sugar-blocker that prevents the body from digesting sucrose.
5. BioLumen, who will be pitching at Rabobank's Foodbytes! Pitch event in November, have developed what they call a "caloric elimination technology" that creates a dietary fiber that absorbs sugar (and fat) in the stomach.

## d) Keep Cutting – We are not there yet

Perhaps we haven't cut our sugar intake enough to have had an impact? The Dietary Guidelines for Americans advises us to limit our intake of added sugars to less than 10% of our daily calories. By Marion Nestle's calculations, even at current consumption levels, "the US food supply provides at least three times the upper amount of sugars recommended." Interestingly, the USDA have a related set of "loss-adjusted" food availability data to the one previously cited here that accounts for waste, spoilage, etc., along the food chain, to "more closely approximate actual consumption." In the case of sugars, they consistently apply a 41% reduction to the food availability data previously cited (so roughly no change in the overall reduction in consumption of about 19% between 1999 and 2019). According to these loss-adjusted estimates we each 'consume' about 344 calories from added-sugar. That represents about 17% of our daily energy requirements. On either calculation, clearly, we have a long way to go but maybe current trends will get us there eventually?

## e) Stop digging – At least until we know more

Alternatively, perhaps we are on the wrong path and should be asking ourselves, “In terms of making the biggest impact, by putting the spotlight on sugar, are we really focusing on the right issues?” To repeat, by itself the USDA data on sugar availability is insufficient to draw strong conclusions other than to note the trend for the caloric sweetener consumption, particularly HFCS, is downwards. As my colleague Andy Duff noted, “the observed divergence of trends in obesity and sugar consumption in the US isn’t the result of a controlled experiment. A lot of other things have been changing this Century in terms of demography, consumer habits, etc., that might impact the rate and intensity with which the result of any reduction in sugar consumption comes through in the obesity data, assuming a relationship exists.” I would add, neither does the data provide vindication for any food and beverage companies who might feel they have been unfairly blamed for rising obesity levels.

# Imprint

## **RaboResearch**

Food & Agribusiness

far.rabobank.com

Nicholas Fereday

Executive Director

nicholas.fereday@rabobank.com

+1 347 215 4158

© 2021 – All rights reserved

---

This document is meant exclusively for you and does not carry any right of publication or disclosure other than to Coöperatieve Rabobank U.A. ("Rabobank"), registered in Amsterdam. Neither this document nor any of its contents may be distributed, reproduced, or used for any other purpose without the prior written consent of Rabobank. The information in this document reflects prevailing market conditions and our judgement as of this date, all of which may be subject to change. This document is based on public information. The information and opinions contained in this document have been compiled or derived from sources believed to be reliable; however, Rabobank does not guarantee the correctness or completeness of this document, and does not accept any liability in this respect. The information and opinions contained in this document are indicative and for discussion purposes only. No rights may be derived from any potential offers, transactions, commercial ideas, et cetera contained in this document. This document does not constitute an offer, invitation, or recommendation. This document shall not form the basis of, or cannot be relied upon in connection with, any contract or commitment whatsoever. The information in this document is not intended, and may not be understood, as an advice (including, without limitation, an advice within the meaning of article 1:1 and article 4:23 of the Dutch Financial Supervision Act). This document is governed by Dutch law. The competent court in Amsterdam, the Netherlands has exclusive jurisdiction to settle any dispute which may arise out of, or in connection with, this document and/or any discussions or negotiations based on it. This report has been published in line with Rabobank's long-term commitment to international food and agribusiness. It is one of a series of publications undertaken by the global department of RaboResearch Food & Agribusiness.