

## **FDIN Sugars and Sweeteners Masterclass, May 8<sup>th</sup> 2014.**

*An independent commentary from seminar observer and 'scribe', Tim Nicol, whose opinions are not necessarily those of FDIN or anyone else for that matter.*

*These are notes designed to supplement the slides that are available as downloads.*

Who would have thought that an apparently specialist subject such as this would end up being the biggest and best ever (according to feedback scores) FDIN Seminar? The London location seems to have boosted attendance to these great events, and every single seat was taken as we kicked off on Thursday 8<sup>th</sup> May.

There's a warming familiarity about how Jeffrey introduces the day, with old lags like me recognising the oft-repeated stories and protocols, but it shows that innovation isn't everything!

Our Chair for the day, Dr Carrie Ruxton, was introduced as a 'chum', and nutritional adviser to FDIN. As a dietician and writer she's certainly well placed to marshal all the inputs and views on this topic, and she has assembled a diverse and knowledgeable panel.

Carrie's set up was that this is the 'Right topic, at the right time' - A day when people can discuss ideas, a day for getting to the bottom of the issues. She wanted the day to be proactive and constructive, with everyone going home knowing what they are now going to do with products.

My notes to accompany Carrie's slides:

- The definition is not simple nor is there much agreement about what is 'good' or 'bad' sugars.
- We now understand that starch behaves in similar ways
- Many different sugar guidelines around the world.
- EFSA opinion is that there is no evidence to suggest the need for an upper limit.
- Intake declines with age, but on average is always above the recommended UK intake levels.
- The biggest source of sugar in diet is in soft drinks.
- Interest in sugar comes from 2 sides- health, (obesity, heart disease, dental disease, cancer, diabetes) – but we all have a sweet tooth.
- Data and studies constantly contradict, even in academic studies, and confuse us all
- Debatable whether there is any difference between extrinsic and intrinsic sugars
- Key research questions- how much sugar can people reasonably eat without risking health problems?
- Is it about the sugar per se or is it a mix of correlating factors?
- Do different sugars behave differently?
- In giving advice we need to be evidence based and objective

Carrie finished her comprehensive introduction by headlining the agenda, and pointing out that it covered a wide range of views and opinions. As if to prove that point, the next speaker was not Aseem Malhotra, as billed, but Prof Graham Macgregor, the Professor (of Cardio-Vascular Medicine, not nutrition) who started and Chairs CASH, the Consensus Action on Salt and Health, and is now Chairing "Action on Sugar". He was put on early as he was just back from Dubai and was between flights, so his time was tight. It's fair to say he made the most of it.

Notes to accompany Prof Macgregor's slides:

- Just back from Dubai, there are conversations all over the world about salt and sugar
- Wants to take a more holistic view, not into detail, it's boring
- His aim is to prevent suffering
- What are major underlying single causes of death?
- Raised blood pressure causes around 9 million deaths pa worldwide. (Chart outdated) High Cholesterol no 3. Tobacco no 2.
- Obesity, diabetes, cholesterol, high blood pressure caused by "ultra processed foods"
- Govt Fruit and Veg consumption campaign hasn't worked- consumption up only 0.2%
- Ultra processed food- contain high sugars, sat fat, salt, without feeling of satiation
- Slides of Lunchables, Bernard Matthews Dinosaurs, Big Mac – (bit outdated)
- We are "mad allowing our children to eat this"- slide of obese American child.
- Economic cost of obesity UK £29bn 2011
- "This type of food is available everywhere"- it's unavoidable
- Increase in portion sizes (some dated, some not)
- "Onslaught from food industry- relentless pressure on consumers, unprocessed foods are everywhere. Marketed to children. Scandal that we allow these products that are going to kill you to be marketed"
- Obesity and Diabetes are twin epidemics. If you don't get obese you don't get type 2 diabetes.
- Who is responsible? Can't blame consumers or government
- Food industry must change, "they know it, it's just a question of time"
- Call to ban all food advertising to children.
- Attacking everyone's morality for working in the industry
- If Pepsico wanted a meeting with David Cameron tomorrow it would happen.
- The way the food industry behaves is in some ways similar to tobacco companies
- Food industry has strong ties to, and influence on, government
- Voluntary reformulation- UK salt intake reduction as example of success
- 15% reduction to 8.1 g/day, aiming for 6g ultimately
- So far c 18,000 strokes and heart attacks prevented pa (9,000 fatal)
- Congratulations to UK food industry in UK for leading the world in this

- Added sugar is similar to salt
- “Sugar makes inedible food palatable” (- sniggers from the audience)
- Sugar is only recently part of human diet
- Sugar is an unnecessary part of our diet- only 200 years old
- Major cause of caries- major cause of pain in children
- Caries has been dismissed as an important disease by the food industry
- Hidden sugars in example products (see slides)
- Figures from National Diet and Nutrition Survey were criticised as understated, but then used anyway.
- Added sugar at 62g/day- is a ‘serious underestimate’
- 30-40% reduction is the aim
- Suggesting government targets a 10% reduction in 1 year- “easily done, no-one would notice”
- The a 40% reduction by 2020
- Government should start to enact legislation, but have a voluntary code with strong enforcement and clear and transparent monitoring programme
- He calls for slow and unobtrusive reformulation, so there is no rejection by the public
- Andrew Lansley is a “Madman” for stopping FSA from introducing legislation.
- Next-start a similar fat reduction programme focusing on sat fats, ban all food advertising to children, and spread the campaign worldwide
- Conclusion- Global food must reduce salt, sugar, fat.

I’ve been to a few conferences and seminars in my time, and this single presentation takes the biscuit for moral outrage backed by personal opinion and flimsy data. The aggressive and emotive delivery was at best discourteous, and to expect an audience of largely junior and middle managers in the food industry to respond to his finger pointing accusations was unfair. The conversation around my table afterwards (and the barely suppressed guffaws during it) showed that all this approach does is to entrench both sides in an argument about an important issue that will only be resolved with sensible balance on all sides. Some in the audience had obviously experienced The Professor Macgregor Show before, but for this first timer, it left me more outraged about the presentation than the health issues within it.

The contrast in the next presentation couldn’t have been greater, and the unenviable task of following Prof Macgregor went to Julian Cooper, Head of Food Science at AB Sugar, where he has been for 34yrs, a Chemist by background.

His presentation was entitled “Sugar functionality and the reformulation challenge”, and the good natured, smiling, mild mannered Dr Cooper opened up by saying that surprisingly, he didn’t disagree with much of what Prof Macgregor said.

However Obesity is a complex multifactorial issue- and singling out sugar is misleading and confusing, and this was the key point of his argument. Clearly Dr

Cooper had shared platforms with Prof Macgregor before, and his point that Sugar is not salt was also critical. Salt has a unique functionality-taste, whereas sugars do a lot more than provide flavour.

Notes to accompany Dr Cooper's slides (which are pretty self explanatory):

- What is sugar? "C's and O's and H's" (Carbon, Oxygen, and Hydrogen molecules) In Mono and Di combinations. Oligo- and Poly-
- and Di-saccharides
- "Sugars" are not just sugar.
- "Sugar" on declarations is sucrose
- The volume of sugar purchased is in long term decline
- There has been a major reformulation in soft drinks- many will have reduced sugar content
- Other important functions of sugar - structure, texture, colour and flavour formation, fermentation substrate, preservative
- Sucrose is gold standard of sweetness, but actually fructose is sweetest. The combination of sucrose and fructose is best
- Why reformulate? Primarily but not exclusively to reduce calories in products.
- What can be used to reformulate? (see list of substitutes for various functions)
- However there are consequences....(list including "gastro-intestinal consequences")
- High intensity sweetener used as replacement in hazelnut spread caused botulism
- Reducing sugar may increase calorie intake
- Energy density calculation- calorie reduced cake
  - Calorie density actually increases as sugar is removed- as less weight is used.
  - See the stepwise reduction slide- reducing sugars from shortbread shows how calories per 100g will increase.
  - "Prof MacGregor would say have a smaller biscuit!"
- Simple maths shows- the food industry is not stuffing products with sugar willy nilly
- Great example of reduced sugar cereal- claimed 1/3 less sugar- but only 2 cals/100g reduced.
- Excellent summary slide:
  - Sugar - natural, traditional, multifunctional ingredient
  - Sugars are not just sugar
  - Singling sugar out as only cause of obesity is misleading
  - There is no 'silver bullet' to solve obesity
  - Sugars 'consumption' is declining
  - Reformulation must deliver a reduction in calories
  - Stepwise reduction may have unintended consequences
  - Sugar is not salt

Having mounted a lively good natured defence of sugar, Dr Cooper was then obliged to join the Professor for a hasty and rather one sided Q&A.

### **Q&A**

Where is he (Prof MacGregor) aiming?

- Soft drinks- he acknowledges the weight/density issue in baked goods, liquids are easier to change. He is having successful meetings with supermarkets. Reducing sweeteners as well as sugar, to reduce all levels of sweetness. Coke and Pepsi- ‘they will have to change their formula, there’s no doubt’  
“All of you could do a 10% reduction now, why don’t you do it?”

How about aiming for an alcohol reduction?

-Not practical

Doesn’t banning advertising to children stop educating about choice?

-Prof MacGregor backtracked here – aiming to ban advertising on all “unhealthy foods”, not all foods. He fully supports making healthy food sexy.

Dr Cooper didn’t get a word in, and Dr Ruxton was unable to control the diatribe.

We all went into a welcome break- the room was buzzing, frowning, and wondering “what was all that about”?

I was particularly pleased to see the sugary Churros provided to accompany our coffee. I had two. They were delicious.

After the break, Dr Charlotte Evans, Lecturer in Nutritional Epidemiology, University of Leeds took the floor to talk about the evidence on sugar and health. I think most of the audience felt that “now we are getting somewhere” as the Doctor told us it was “Good to get out of her academic bubble” and explained the methodology and some of the results of a major study and systematic review, the full results of which will be published later this summer.

Notes to accompany Dr Evans’ slides:

- She and her Leeds University team are looking at the dietary causes of disease.
- Sugars mean different things to different people. When she talks sugar she means added sugar. In the Eatwell plate and DoH recommendation, non milk extrinsic (added) sugars recommended to be 10/ 11% of food energy.
- CVD (CardioVascular Disease) is the main focus- in UK we’ve made great progress but we’re not the best. Not just about death rates but quality of life- mortality and morbidity.
- NHS healthy heart advice doesn’t include sugar.
- So what evidence is there to link sugars to Cardio Metabolic Health?
- Evidence- epidemiology looks at populations. There is a hierarchy of evidence with meta –analysis at the top. A review of all published studies.

Charlotte reviews cohort studies- where groups are recruited and followed over time, with results presented as risk. Also reviews trials- shorter term studies with control group and intervention group.

- Problem with a cohort study is isolating sugar intake from other factors, which have to be adjusted for. Currently evidence isn't strong to link CVD and sugar intake. The systematic review may provide better evidence. There are other limitations to cohort studies.
- Looking at a systematic review of trials, use pool of all the means studied, weight overall went up 0.75% with intervention group. These trials are done with small numbers of people over short period of time, and are costly to run. However if you don't increase calorie intake on a high sugar diet there is no weight gain.
- Fructose in natural form (ie Fruit) doesn't increase risk of CVD and Diabetes. Fructose as added sugar is similar to sucrose in terms of health outcomes
- Sugar Sweetened Beverages are important because they form a large part of intake in certain groups, especially children
- No systematic review of SSB and CVD Risk
- Individual cohort studies show 20% increased risk of CVD among upper quartile of consumption
- Fruit juice may increase risk of type 2 diabetes.
- Drinks have high GI index- reformulating to reduce this would be worthwhile
- There is a stronger association between SSB drinks consumption and weight gain.
- Gaps in evidence- e.g. no systematic review of cohorts on total added sugars and CVD and Diabetes.
- A selection of recommendations around the world shows inconsistencies
- Industry Funding of studies- recommended to follow BMJ guidelines for good publication practice
- Conclusions slide:
  - Higher intake of sugar sweetened beverages is associated with increased risk of diabetes and causes weight gain in adults
  - Higher intake of total added sugars causes weight gain in adults
  - There are some important gaps in the evidence – The difference between lack of evidence available and evidence of no association should be noted
  - This area of research is fast moving and different countries/regions are reviewing their recommendations for added sugars taking new evidence into account

Having had a very informative exposure to scientific data, we then moved on to some market data from a conference regular and Mintel “lifer”, the polished but down to earth David Jago, Mintel’s Director of Innovation and Insight. He headed his presentation “Sugar and Sweeteners, the Consumer and Industry’s Response”

His slides had plenty of useful stats and comment:

- **Sugar and sweeteners-**
  - Low sugar is considered as a healthy claim and option, especially among women and older consumers. However consumers tend to be skeptical of sweeteners. 58% are 'wary of the ingredients/sweeteners in diet food products'. Artificial=bad, natural=good, and sugar is seen as natural.
  - Consumers cite sugar reduction as a key (no 8) weight management strategy.
- **Latest Trends; How are products formulated and positioned**
  - Soft drinks is the top category in terms of UK NPD introductions with low/no sugar claims, as a % of all introductions. However that's only about 20%, and all other categories are lower and most are declining. AceK, Sucralose, Aspartame, Stevia are being used, in that order.
  - Diet/low cal CSD's grew 18% vs regular CSD's 4% 2010-12. Diet/low cal is now 45% of markets. Only 34% in US, and only growing 2-3%. Seltzer/water brands growing instead.
  - Low sugar juice drinks are just 16% of segment by value, down from 20% in 2010.
  - Low sugar claim is 3<sup>rd</sup> factor in choosing juice and drinks
  - Trop 50 was a success compared to Del Monte naturally light; both included Stevia. It's not all about the ingredient.
  - There are diverse messages for low sugar positioning; from 'Rediscover Sprite' to 'no added sugar, no aspartame' to '50% pure juice, 50% spring water'.
  - Kids snack purchase influence criteria- 44% look for products that deliver 1 of '5 a day' natural fruity, but 34% look for low sugar/salt.
- **Sugar Reduction**
  - Reformulation strategies vary
  - Sugar replacement strategy- E.G. Bear "with no added nonsense" (Sweetened with coconut blossom nectar)
  - Purchasing influences for most categories show 29-30% citing low sugar/sugar free as an important attribute.
  - Stevia is no longer a 'destination ingredient'.
  - Plenty of examples of front of pack claims promising low/no type claims, or more exotic wording, but on the declaration it lists "sugars"; how can consumer work this out?
  - Very low numbers of "low/no" introductions in other segments; e.g. sweet biscuits.
  - More holistic healthy claims and product positioning are stronger

## **Conclusions:**

- Sugar reduction will continue to be a research priority
- But the reality is that market penetration of reduced sugar foods remains relatively low
- Consumer interest is high, but consumers may be deterred by a negative taste perception, confused by on-pack messages

After Jeffrey's time honoured bribe to the audience to stay to the end in the hope of getting picked for the Magnum of Champagne, we had a good lunch, and returned for some more sweet education, this time from Cathy Capelin, Kantar Worldpanel's Strategic Insight Director.

Her presentation was entitled "The Facts About Sugar in the GB Shopping Basket" and after the mornings' opinions, this was a welcome presentation of facts. Kantar's data is drawn from their 30k household panel, supplemented by a consumption diary.

Cathy looks after Kantar's nutrition service. They search about 60k products every 3 months to understand the nutrients that are being consumed in the UK.

There were plenty of "fascinating facts" in the slides; here's what caught my eye:

- Over the last 15 years, health as main driver of choice has risen from 11% to 22% but so has enjoyment (34% to 39%). Practicality fell from 55% to 39%.
- Average calorie density in take-home food and drink has risen significantly.
- Over the last 7 years, 8% more take home food volume has been purchased, but a 12% increase in calories. Sugars+11% Saturates+ 13%. (total sugars). Same figures for last year.
- On average 121g of sugars is being purchased every day. About the same as GDA, but excludes out of home. Sat fats and sodium are worse.
- Key contributors to sugar in shopping baskets are fresh fruit and packet sugar. Milk is number 4 (!)
- Almost 90% of the panel say they have some concerns about the amount of sugar they consume, with about 26% "very concerned". This group have changed behavior- they buy less sugar. This varies by category though, with Juices declining more than biscuits. However intent doesn't always match achievement; in "5 a day" for example,
  - 63% claim to have
  - 31% try to have
  - 11% actually have"
- Demographics are important- lower socio-economics, families, and older age groups consume more sodium, saturates, sugar, and calories than average. (Not massively skewed though)
- Promotions are a factor- 39% of sat fat is bought on promotion for example. Less for sugar, (34%) but that's why promotions could be a focus for legislation in future.

From market data we went back to a product focus, with Sarah Marshall of RSSL talking on "Options for Sugar Reformulation". This was a technical presentation, with a 'health warning' from the start about data, and the fact that many of the available charts would be passed over, but remain available; there are 50 in her downloadable deck. We were also warned to keep our hands off the samples of soft drinks that had appeared on our tables.



Some of the introduction went over ground we had covered earlier, but the repetition served to help imprint it in my (unscientific) mind at least. Here are my notes:

- Sugar is a reserved description for sucrose. 'Sugars' is anything with an – "ose".
- Drivers for reformulation are health and costs. Sweetening with high potency sugars costs less but adding polyols etc for texture costs more.
- Tooth decay is caused by the frequency of consumption of fermentable sugars. It's another driver.
- Technical innovation or health benefits:
  - Isomalt is used to replace sucrose and glucose in hard boiled sweets. Xylitol has recognized health benefits around oral and dental health.
- Properties of sugar need to be considered when replacing it- e.g. preservative, texture, colour effects.
- High Potency Sweeteners are not new; Saccharine was discovered 1878. Long list of natural and artificial sweeteners. Majority of market is in Cyclamate

We then tasted 3 samples of Apple and Mango Drink- 3 different codes, without identifying recipes or ingredients. These were later revealed as 100% sugar, 50% sugar, no added sugar. If there was a conclusion based on this rather unscientific test, it was that blends work better...

- Bulk sugar replacers are used to compensate for the bulking effect of sugars where HPS (High Potency Sweeteners) are used. Polyols were listed. (See slide 36) Varying sweetness relative to sucrose; Fructose is the sweetest. But digestive issues and laxative properties happen between 20 and 120 gms/day consumption depending on the type.
- Where polyol content exceeds 10% products must be labelled with laxative warning.
- Polyols do have a calorific value; 2.4 kcal/g.
- Advice is to use the one that most closely mimics the sugar to be substituted in the final product. (Not surprisingly)
- Conclusions
  - Sugar has many properties
  - Many reasons to replace sugar
  - Sugar replacement has a long history
  - To create the most acceptable sugar free product a blend of ingredients is required to replace the sugar
    - High potency sweeteners
    - Bulk sugar replacers
  - Replacement blends need to be tailored to fit the application

Sarah then asked the audience for a show of hands in response to the question, "who's for sugar reduction?" Almost everyone put their hand up. Which I guess was not too surprising.

Now we were briefed and prepped on the market background, the science, and the controversy, we were clearly ready for a Case Study from the real world of entrepreneurial food marketing and NPD, told in a very human and heart warming style by Mick Shaw, who with his wife (Lizi) started the GoodCarb Food Company, producers of “Lizi’s Granola”

Mick is a former scientist and organic livestock farmer with, as we have established, a wife called Lizi. His fundamental thinking is based on the distinction between GI, (Glycaemic index) and, GL (Glycaemic load), as espoused by Prof Walter Willet, of Harvard Med School, who came up with the Healthy Eating Pyramid, which Mick used as the basis of his product development.

As an explanation of his move out of farming, Mick asked the rhetorical question, “How do you make a small fortune in organic farming?” Answer- start with a large one! He got out of farming and into food with encouragement from Rachel’s Organic Yoghurt. Applying his Science and Farming experience together, he started his own food business, founded to develop low Glycaemic Food. The Granola came from Lizi’s own home made recipe she used for her guests in their B&B. Lizi’s now has sales of £10m, of which 25% is exported.

Slide notes:

- GI rates the glycaemic effect of the carbohydrate in foods relative to glucose.
- GL of a serving is measured in grams of glucose – the equivalent effect of consuming a serving of the product.
- His graph of blood glucose levels was made with home blood testing equipment (since validated)
- GL per 100g gives a % of the food that ends up as glucose in the bloodstream. Cornflakes have a higher GL than table sugar- you could add sugar to reduce GL!
- Granola – Sugar content varies from 9% (Lizi’s) to 27% (Kelloggs). Category annual sales of £44m, growing at 47% due to Kelloggs entry and advertising.
- Lizi’s uses fructose instead of sucrose. Fructose is accused of being “the devil’s candy” by Dr Robert Lustig’s followers. Fructose is sweeter but doesn’t enter the bloodstream, it goes straight to the liver. However Fructose has been in the human diet since the origins of homo sapiens
- Mick and Lizi have been developing a low (<5%) sugar granola.
- Tried Stevia- taste problems
- Discovered Oligofructose is less stable
- IMO had to have a diabetic warning
- In the end they just put less sugar in! New product will be launched soon in Waitrose. It includes a serving suggestion with fruit and yogurt for sweetness...

The real problem, according to Mick, is that it’s not what we eat that makes us ill, it’s how much we eat. Sugar tempts us to eat more. Modern lifestyle encourages an energy imbalance. Lack of exercise is a much bigger factor in ill health than

diet. It's a bigger risk factor than smoking. (There's that comparison again...)

The day was tailing off when Ailbhe Fallon, of Fallon Currie Consulting took over to talk about "Sugar, the Media, and Rising to the Challenge", which Carrie positioned as a "call to action" to finish the day with, from a "science based communicator".

Ailbhe's main points were:

- This is nothing new; sugar reduction calls have been around for a while
- Anti-saccharides have even been around since George III's time- as an anti slavery appeal.
- But it's now a public health issue
- The "Players" are Government, the Opposition, and their advisers
- The "Experts" are medics and scientists (Prof McGregor is clinician) but they don't necessarily know much about nutrition. There is not much dialogue between food scientists and experts.
- The "Campaigners" are pundits in the Media – typically Daily Mail screaming headlines, a BBC conducted poll, and even the New Scientist getting in on the act.
- Risks
  - All this can lead to taking the "eye off the ball" and distractions from the day to day.
  - Clean labelling has become the knee jerk reaction to consumer sentiment.
  - "Artificial ingredients are safe" ....(?)
  - We risk demonising sweetness
- Opportunities:
  - Focus on the benefits- the positives not the negatives
  - Myth busting and telling better stories
  - Role of sweet taste

So the challenge according to Ailbhe is to generate the right message- we have that in our hands. We know our products, and our markets. We should use research and data, well interpreted. Finally, science is a strategic issue- we need to fill the gaps in our knowledge. (Agreed!)

Personally I thought the issues and data presented earlier in the day provided more practical and fundamental advice in dealing with what is clearly a major and very real health issue that challenges the freedom of choice among consumers and manufacturers.

As is so often the case, marketing and NPD professionals in the food industry are left to make some tough choices in responsibly developing and promoting everyday, popular products to a consumer that may be better informed, but often is not driven solely by logical health concerns in their product choices and patterns of consumption.

Heavy stuff, sugar!