



Genetics of Obesity Study

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GOOS Newsletter

Winter 2015

Seems like only yesterday that we were looking forward to summer and now it seems we may be heading towards a rather severe winter (if you believe what you read in certain newspapers)! It's taking its time coming though, only just really had any frosts here in Cambridge but the odds have apparently shortened for a white Christmas. Could the forecasters be right?

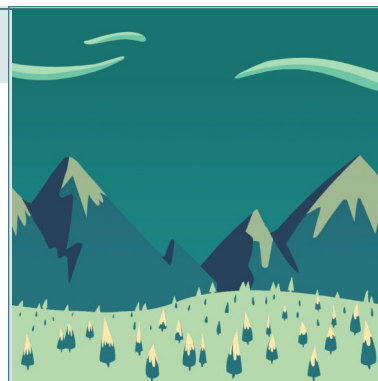
Seriously though, how do you really know whether something you read or hear about is true or not? Sugar seems to be the latest evil! Should we be cutting back on sugar and indeed fats? And if we do, will this really help us lose weight and make us healthier? Probably not something any of us really want to think about with Christmas just around the corner!

But, if you are trying to reduce the sugar and calories in your diet, you may turn to artificial sweeteners or other sugar substitutes. You are not alone. Today, artificial sweeteners are found in a variety of foods and drinks, often advertised as "sugar free" or "diet". Some manufacturers call their sweeteners "natural" even though they are processed or refined. Artificial sugars are an attractive alternative to sugar as they add virtually no calories to your diet. Sounds too good to be true and oh dear, maybe it is! Some research has suggested that artificial sweeteners actually cause an increase in weight by acting on bacteria in our gut decreasing the efficiency of how our body processes glucose. Back to sugar then, but maybe just less of it?

So what about fat? Consumer demand has led to an ever increasing choice of low fat foods. Fat substitutes are used to replace and recreate all the lovely attributes of fat such as flavour, taste and the feel in the mouth while significantly reducing the fat and therefore calorie content. But oh dear, it seems that these foods may cause weight gain and not weight loss! The studies are a bit out of date, but they seem to show that these fat substitutes interfere with our body's ability to regulate what we eat leading to inefficient use of the calories eaten and then eventually to weight gain. How can a fat substitute confuse the body like this?

You can read more about our work with sugar and fat substitutes in our "Research Highlights" section on the next page.

Before you read the latest news from Professor Farooqi, can I take this opportunity to thank all of you who have helped us in Cambridge with our research. We love hearing from you, so keep in touch - only by working together can we bring about change. Have a great Christmas everyone.



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SPECIAL POINTS OF INTEREST

Sugar and Fat Substitutes

News From The Professor

I thought I would follow up on from my piece in the last newsletter, and tell you more about the work that we are doing to try to find new treatments for weight problems.

Over the last couple of months, I have been talking to academic groups and biotechnology companies that work in the area of drug discovery. These are groups who are actively trying to develop new medicines for a range of conditions. They focus on the very first step in the process, which involves taking a potential gene or molecule that we think is important in controlling weight, and finding out if we can make a medicine that will improve its activity.



Ten years ago, this work could only be done by very large pharmaceutical companies, and was generally something that Researchers such as ourselves were not able to access independently. However, science is becoming much more open, more resources are being made available to drive innovation, and there are many research groups such as ourselves, working to take this kind of research forward.

I think this is a really great idea, because it allows researchers to directly communicate with the people who are trying to develop drugs, without lots of layers of bureaucracy in the middle. I'm very pleased that both the Drug Discovery Unit based at the University of Dundee, and the biotechnology companies near Cambridge that we have discussed our proposals with, were very excited. We are likely to work with both groups so that we can maximise our chances of taking forward genes that we've discovered from working with people with weight problems. It is still a long, complex task, but as technologies improve, we will have a better chance of taking this kind of work forward in a high throughput way (testing hundreds of potential drugs against all our interesting genes).

A major focus of our group moving forward is an area called computational biology, sometimes known as "mining big data." New technologies have allowed us to look at thousands of genes at the same time, but we have to work out how to handle all of this data and then use it as cleverly as possible try to identify real, meaningful information that is relevant to patients. This means that we need to keep innovating, we need to bring in new ideas and new people. To this end we are now seeking to recruit talented young scientists with computational skills who can help our research. We are also looking for more funding to enable us to scale up our efforts to make sure that we work as efficiently as possible to find the next potential drug targets for weight problems. We will certainly keep you updated on our progress!

Latest Research Highlights - Sugar and fat substitutes

In two parallel studies, we have replaced regular food ingredients with similar tasting substitutes commonly used by the food industry. This has allowed us to study how certain food ingredients might change our hormonal response to food and also our preferences for our next meal.

The first study focused on sugar and a sweetener called "erythritol", while the second study compared different preparations of fat in a standard breakfast.



1. Study on sweeteners

Sweeteners are frequently used in 'low calorie' food items to lower calorie intake and therefore weight gain, but with limited success.

In the last 20 years or so, there have been many studies into the use of commonly used sweeteners such as "aspartame" and "saccharin", but much less is known about a more recent type of sugar substitute called "erythritol", which is already found in some food brands.

In this study, we provided participants with 3 different breakfasts on 3 separate occasions. So, a typical breakfast would contain either normal sugar or the sweetener erythritol. Because there are no calories in erythritol, we also provided a larger breakfast (with sweetener) to match the calorie content of the breakfast with normal sugar.

Both before and for several hours after the participant had eaten a particular breakfast, we used tools to see how hungry and full they felt and also took blood samples to measure particular hormones produced by the body in response to eating food. Some of these hormones are known to affect our appetite and let our brain know when we need to eat again. At the end of the study, we provided a buffet lunch of both sweet and savoury food types to see if people had any preference.

Our results indicated that hunger ratings were similar with both the sucrose and sweetener breakfasts. Hormone measurements were also similar and there appeared to be no preference for particular food types at a buffet lunch.

Does this mean that erythritol is a good substitute for sugar? Our studies would suggest that this is indeed true.

2. Study on fat substitutes

In a similar study, participants were given either a standard breakfast of regular or low fat content, or a breakfast where the fat is either encapsulated (a microscopic layer of starch surrounds the fat) or a fat mimetic is used. This fat mimetic has the same feel as fat does in the mouth, often called lubrication, but does not have the same content or indeed calories as regular fat.

Again, we wanted to find out how hungry and full our participants felt at regular intervals and whether there were any changes in the hormones measured in their blood. We wanted to know if the different breakfasts would affect both of these measures.

Again, hunger and fullness, as well as hormone measurements were similar between the different breakfasts.

At the lunchtime meal, we provided “tasters” of different meal types and this test also showed that there was no preference for specific tastes.

From our study, it seems that the manipulation of fat in various ways does not alter a person’s hunger, fullness or hormones.

We hope that these studies will contribute to a better understanding of how the body reacts to different types of nutrients and indeed food substitutes.

Thanks to Dr Tinh-Hai Collett (Research Fellow)

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Visit GOOS at www.goos.org.uk to meet our team and learn more about our work.

Or email us at info@goos.org.uk to stay up-to-date with what we’re doing and how you can get involved.

If you would like to know more about our new studies, contact us at info@goos.org.uk.



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