INFORMATION BOOKLET

FRUCTOSE IN SCHOOLS

2020

PURPOSE

The Fructose in schools study (FISS) aims to provide students with a positive research experience & an opportunity to engage in a real-world scientific experiment, conducted by themselves.

The purpose is to understand whether there are significant differences in fructose absorption in NZ children & how this relates to the trajectory of obesity development.

Beginning in 2017, FISS is a project that is delivered to kura throughout NZ by The Moko Foundation. The data from this is then used to inform future practice & policy throughout the health system pertaining to the impacts of sugar.

Through the process of this research, students develop a better understanding of metabolic health, nutrition & scientific literacy

BENEFITS

Schools & Wider Community

- A chance to partake in a national study, the first of its kind!
- An opportunity to be involved with research that will influence future health care strategies
- A delivery of scientific knowledge in a way that is relevant and within context of the community

Teachers

- Complimentary to the scientific curriculum
- Flexible extra-curricular engagement for students

Students

- Exposure to passionate Māori health students
- New energy within the classroom through outside deliverers
- Learning through a fun, interactive activity promoting healthy lifestyles through scientific literacy

PROCESS

The night before:

Students fast from 8pm the night before day of testing.

On the day:

Whanaungatanga is an important aspect of our work, we explain who we are and our purpose before beginning the experiment with the Tamariki

We explain how to use the breathalysers and students take their baseline breath & Hydrogen level readings.

We provide a drink, consisting of sugar dissolved in water – equivalent to a can of coke.

The students collect their data, using breathalysers to measure their breath hydrogen levels, every 15 minutes for 1.15hours

During this we do a presentation about metabolic health, & nutrition

Once testing is completed we provide a kai for the tamariki.

ENGAGEMENT

Days leading up to delivery:

- Meet with our contact in the school to discuss a potential delivery
- Organise an appropriate time for the delivery
- Provide information sheets & newsletters for tamariki to take home to whānau
- Ensure there are reminders in schooletters & social media outlets regarding the upcoming study & delivery

Day before delivery:

- Ensure all permission slips have been returned back to school, with consent given from parents for tamariki to participate in the study
- Ensure the principal permission slip is signed & ready
- Remind students about fasting from 8pm the night before. No food, or drink other than water can be consumed after 8pm the night before, until the study is over (this includes breakfast).
    - Teeth brushing is fine

Day of delivery:

8:30am	**INTRODUCTION** **Whakawhanaungatanga:** • We start by explaining who we 'Waharoa ki te Toi & The Moko Foundation' are • What the study is intending to achieve • How the morning will roll out!
8:55am	**TESTING PERIOD** • Students are split into groups (3-4 tamariki per breathalyzer) • Once students have completed a baseline test, tamariki then drink the pre-made fructose solution • They then test themselves every 15minutes for 1.15 hours • Whilst students are testing we provide a sugar & diabetes presentation
11:00am	**KAI TIME**
11:30am	**FINISHED/KUA MUTU** • Moko team signout of Kura

WHAT TO KNOW

- Suitable for any college year level, although content is more in line & suitable for year 11 and upwards
- This study is not invasive & poses no health risks to the Tamariki involved
- Things to note & are important for the success of the day:
  - Signed principal consent given
  - Signed parental consent given for each student
  - Teacher or school staff member present during workshop

FEEDBACK

"I want to thank the team for this opportunity. They were fantastic, an inspiration and managed so well the dynamics of bringing the fructose study to our school." **- Whangarei Christian Renewal School**

"It was a great week for the students. They will use the information they have learned to develop a poster that will be portrayed at the school science evening." **- Otahuhu College**

"We do appreciate the knowledge you bring here and share with our Tamariki. They have lots of discussions around what they have done. I can see some interest in the year 10 tamariki, towards health sciences." - **Te Kura Kaupapa Māori o Te Rangiāniwaniwa**

"We value you and your team coming out to our school and would love for it to be implemented in our 2020 plan." **- Broadward Area School**

WHAKAAHUA

FRUCTOSE

Fructose has become an increasingly significant contributor to our diet, now representing over 10% of average calorie intake in USA (Marriott, Cole, & Lee, 2009) and similar amounts in NZ (Thornley, McRobbie, & Jackson, 2010).

Importantly, though, there is a large degree of variability between individuals in their ability to absorb fructose (Berni Canani et al., 2016), which is not the case for glucose.

Therefore, it is possible that high fructose absorbers will be more likely to suffer deleterious effects of excess fructose intake than low absorbers. Despite the potential importance of this issue, there are very few studies to understand the basis for these differences, even less that are specific to Aotearoa.

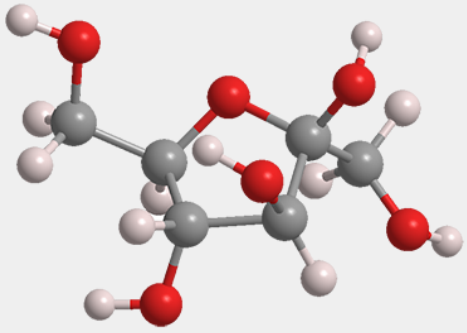
Fructose uptake responses can be affected by age, diet and conditions such as obesity and diabetes (Douard & Ferraris, 2013). However, there is also significant potential that genetic differences could also contribute to differences in fructose uptake.

Glucose and fructose are very similar chemically and essentially have the same calorific value, but fructose is metabolised differently from glucose, with most metabolised in the liver and very little entering the peripheral circulation (Kolderup & Svihus, 2015; Laughlin et al., 2014).

The metabolism of fructose also results in increased production of urate and lipids (Tappy & Le, 2010). Thus, excess fructose intake contributes directly to conditions such as obesity, gout and hyperlipidemia.

QUICK FACTS

FRUCTOSE PROCESSING & LONG TERM HEALTH RISKS



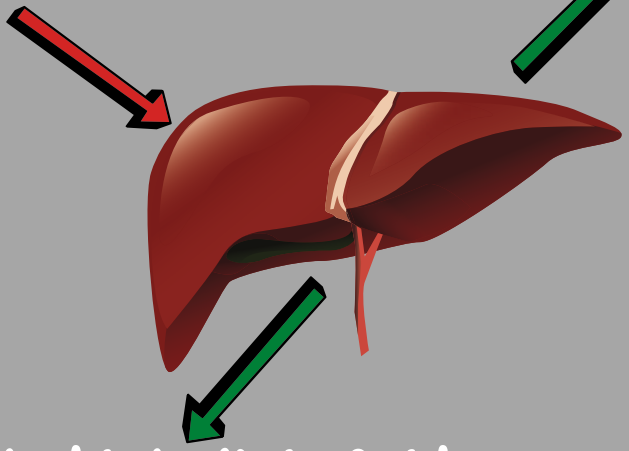
Fructose (a type of sugar & carbohydrate) is consumed significantly in 'Western diets'.

Over the past 30 years, an increase of fructose consumption has been linked with an increase in obesity & metabolic diseases.

Research by TMF & MWC has found most people in NZ are competent absorbers of fructose. Reinforcing that sugar, if prominent in your diet & maintained long term is a major contributor to increasing the risk of diseases.

FRUCTOSE BREAKOWN

Fructose is absorbed into & processed by the liver



Converted into FATS!

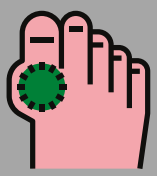
DE NOVO LIPOGENESIS (DNL)

DNL is the process of converting excess carbohydrates into lipids (FAT), which are then stored as 'energy' for later.

This process stimulates our bodies to preserve fat rather than burn it.

This results in our body accumulating fat & holding on to it. Overtime, leading to obesity & other metabolic diseas

Converted into Uric Acid



GOUT

Uric acid is stored & accumulates in the joints (e.g big toe)

THE MOKO foundation

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