

Investigating the maths inside:

Knowing nutrition

Activity 3

Can snacks be good for you?



Can a simple snacks help to manage sugar levels and diabetes?

# Why are glucose levels important?

Glucose is a simple sugar that is used by the body as a source of energy. The level of glucose in the body needs to be maintained within a small range to prevent the development of hyper-glycaemia (which can lead to Type 2 diabetes) or hypo-glycaemia, both of which are very serious health conditions. The *Reading: Glucose, insulin and diabetes* provides more information.

The normal range of glucose in the body is 4.0 to 6.0 mmol/L or 72 to 108 mg/dL. Find out what these units mean.

Type 2 diabetes is described as a ‘lifestyle disease’ and in many cases it is possible to reverse the effects by making some lifestyle changes. Write a paragraph about Type 2 diabetes and the actions that can be taken to reverse its effects. You will find plenty of useful information on the website of Diabetes Australia. <https://www.diabetesaustralia.com.au>

# Can a snack really help?

Snacks are often criticised because of the high levels of sugar they contain. Recently a manufacturer developed a snack that they claimed reduced the level of glucose in the body. They conducted a trial of their snack and compared it to a snack from a leading competitor to test their claims.

They selected 200 participants at random, based on their age, and asked them some questions related to their lifestyle. The data they gathered is provided in the spreadsheet ‘Snacks data glucose’.

Each participant was given a snack at random, either Snack 1or Snack 2. They were told to eat one snack a day for a month, but were given no other information in regard to diet or a particular time to eat the snack. The glucose levels of each participant were measured at the beginning and at the end of the month.

## The clinical trial

Does this trial meet the requirements for conducting an accurate and reliable clinical trial? Use the information you have heard about in Activity 2 to answer the question. Consider the size of the trial and the information that was provided to the participants.

What recommendations would you make to the manufacturer of the snack, to improve the quality of their trial?

# Analysing the data

Assume this was not a full clinical trial, but a small pre-trial to determine if there was enough positive change to glucose levels to conduct a full clinical trial. Examine the data to determine if either of the snacks could be considered for a full scale clinical trial.

You will need to make decisions in regard to:

* sorting the data
* determining the difference between ‘before’ and ‘after’ glucose levels
* identifying positive and negative changes to glucose levels

When you have sorted the data, consider the following questions for each snack before making your recommendation.

* How many participants had normal glucose levels to begin with?
* How many participants had normal glucose levels after the trial?
* How many participants showed a decrease in glucose levels?
* How many participants showed an increase in glucose levels?
* Did any participants go from normal to abnormal glucose levels?

Could either of these snacks be marketed as a food that anyone could eat, or should one or the other or both be classed as a ‘medicine’ and be sold with some guidelines or restrictions? Explain.

# Preparing for a full-scale trial

You need to prepare for a full-scale trial of the snack that you believe has the potential to help manage sugar levels in pre-diabetic individuals as well as those who already have Type 2 diabetes.

Write up a trial proposal, with explanations for your decisions, for a detailed trial including:

* The snack you would trial
* The number of participants
* Any conditions participants must meet
* Recommendations for a placebo

# Websites

<https://www.diabetesaustralia.com.au>

<http://www.health.com/type-2-diabetes/high-blood-sugar-symptoms#high-blood-sugar-symptons>

<https://www.endocrineweb.com/conditions/diabetes/normal-regulation-blood-glucose>

<https://www.csiro.au/en/Research/Health/CSIRO-diets/CSIRO-Low-Carb-Diet-Book>