

Science inquiry, Science as a human endeavour

 Logical/mathematical
  Verbal/linguistic

Glycaemic index

The glycaemic index (GI) is a measure of the effects of carbohydrates on blood sugar levels. Foods that are digested slowly release glucose into the bloodstream at a steady rate. They are rated as low GI. Compare this with foods that have a high GI. These foods are digested quickly and release glucose into the bloodstream rapidly. High glucose levels mean that the pancreas has to produce more insulin.

High-GI foods are suitable as a means of recovery after endurance exercise when the body needs to replenish its energy stores.

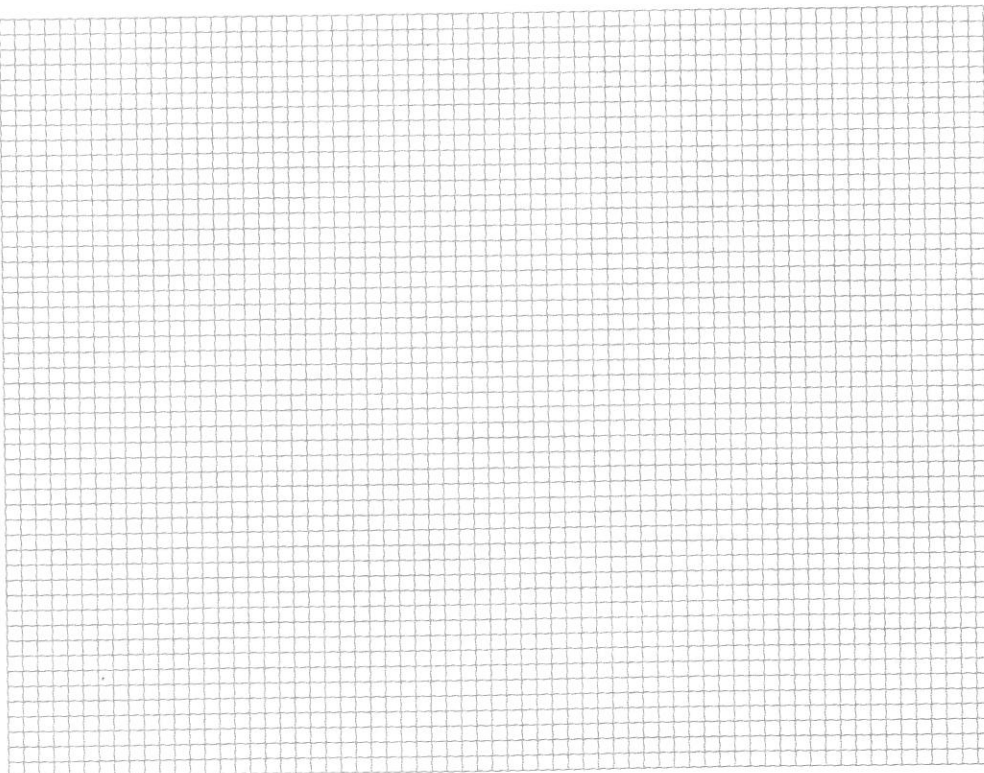
Studies have shown that sustained spikes in blood sugar and insulin levels may lead to an increased risk of developing type 2 diabetes. In type 2 diabetes, the pancreas still produces insulin, and levels in the bloodstream are normal. However, the body no longer responds to the hormone, and glucose levels remain high in the blood.

A diet with low-GI foods helps to avoid blood sugar spikes. This is good for the person's general health. For diabetics it is also a way to manage their blood sugar levels.

The data in Table 7.6.1 show what happens to insulin levels in the blood when low-GI and high-GI foods are metabolised.

Table 7.6.1 Insulin levels in the blood

Time (min)	Insulin level in the blood (pM/L)	
	Low-GI food	High-GI food
0	48	48
15	90	110
30	165	250
45	150	240
60	145	220
90	75	135
120	65	85
150	55	75
180	50	55



1 Construct a graph of the data in Table 7.6.1. Place time on the horizontal axis and insulin level on the vertical axis, with both high and low GI levels on the same set of axes.

2 Analyse the graph to compare the effect of low-GI food and high-GI food on insulin levels in the body.

3 Predict what would happen to insulin levels if data had been collected beyond 3 hours (180 minutes).

GI level of foods

The GI levels of food are classified as shown in Figure 7.6.1.

4 Classify the foods in Table 7.6.2 according to their GI by placing them into the appropriate section of Table 7.6.3.

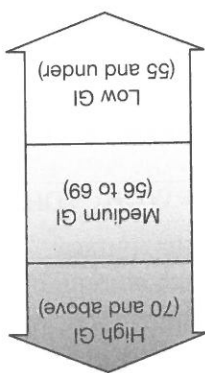


Figure 7.6.1

Table 7.6.2 GI values of food

Food	GI value
Apple	33
Banana	51
Bread (white)	70
Bread (wholemeal)	74
Carrot	39
Chocolate	40
Cornflakes	81
Ice-cream	61
Milk (full-cream)	39
Milk (skim)	37
Pasta	45
Peanuts (salted)	14
Popcorn	65
Porridge	55
Potato (boiled)	70
Potato chips (hot)	75
Pumpkin (boiled)	64
Rice (white)	73
Sultanas	56
Watermelon	76
Weetbix	70
Yoghurt (low-fat)	14

Table 7.6.3 Classification of food

Classification	GI range	Examples
Low GI	55 or less	
Medium GI	56–69	
High GI	70 or more	

- 5 Potatoes, rice and pasta are all good sources of carbohydrate. **Explain** why sports people eat pasta a few hours before a big game, rather than rice or potatoes.

- 6 (a) **Identify** the food that would cause the largest glucose spike in your blood.

- (b) **Explain** why this would happen.
