

# YEAR 11

# HEALTH SCIENCE



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# Eight Principles for Good Health

The first letters of the eight words spell 'NEW START'.



## Nutrients

A well-balanced diet includes healthy fats, protein, and non-starchy vegetables for vitamins and minerals.



## Exercise

Two types of exercise:

1. Cardio exercise can be running, dancing, skipping, or even a brisk walking twice a day. Walk so that you are not huffing and puffing, but so that you could speak a sentence while walking. Cardio exercise gets the heart pumping.
2. Weight-bearing exercise strengthens the bones and muscles. Examples are: walking up and down stairs, gardening, rowing, swimming and weight lifting.



## Water

Drink water according to your body weight. For the average adult, 2 litres a day. Drink on rising and between meals, (not with meals). Drinking with meals reduces the action of the digestive juices necessary for good digestion. Herbal tea counts as water but not coffee or sweet drinks.



## Sunlight

We need sunlight for Vitamin D. Avoid sun exposure during the middle of the day when sunburn is a risk.



## Toxin-free

Have you ever wondered what the tiny numbers mean on many processed food packets? You will find them in very fine print. Most of these numbers represent artificial food additives, some of which can be toxic to health. Food additives are rated in four categories:

1. appears safe
2. adverse effects unknown
3. potentially unsafe
4. potentially dangerous

Why do food safety controllers allow potentially dangerous food additives in some foods? They claim that in such small amounts there will be no ill-effect. However food allergies are on the rise, and it is becoming evident that too much exposure can create health problems. Choose whole foods or make your own foods. Avoid highly processed foods and you will avoid the food additives. Also remember that toxins can penetrate the skin. The skin is a carrier of whatever chemicals we put on it. Be aware of toxins in personal care products.



## Air

Engage in outside leisure activities in the fresh air – the beach, the bush, the forest. Keep the air in your home healthy by opening your windows.

Avoid pollutants like air fresheners, toxic cleaning products and perfumed personal care products. Use essential oils or vinegar and bi-carb soda.



## Rest

Sleeping during natural hours of darkness is what our bodies are designed to do. Rise early and go to bed early. Sleep in complete darkness and avoid digital devices in the bedroom. Choose to rest from your normal working routine once a week.



## Think happy thoughts and Trust in God.

Laughter releases hormones called endorphins. These hormones can relieve pain, reduce stress and give us feelings of pleasure. Mental health affects physical health. Research shows that people who have a faith experience better health. Having faith is more than just a support. It puts us in touch with the One who made us, and knows us. He is a personal God who has answers for us when we ask.

*Psalm 139:13-14: For you formed my inward parts; you knitted me together in my mother's womb. I praise you, for I am fearfully and wonderfully made.*

### Activities

1. Memorize and list the 8 principles for good health.
2. Now put the 8 principles in order of priority in your own life.
3. Write a paragraph on the principle that is top of your list, explaining how you will put this into practice.
4. How can principle number 8 assist those suffering from stress?

# **Carbohydrates, Protein and Fat**

## **Roles of the three nutrients**

### **1. Carbohydrates**

Carbohydrates, (often abbreviated to 'carbs'), are sources of energy. They provide fuel for the brain, muscles, and other tissues during physical activity and daily functions.

They are found in starchy foods like bread, potato, sweet potato, cassava, rice, pasta, lentils, vegetables, fruit and anything that contains sugar. There are 'good carbs' and 'bad carbs'.

#### **Good carbs**

Good carbs, often referred to as complex carbohydrates, are found in natural, unprocessed foods. They are rich in fibre, vitamins, and minerals.

They digest slowly, and are taken up slowly by the blood stream. They do not cause huge spikes in blood sugar levels.

Examples: coloured vegetables, dried beans and lentils.

#### **Bad Carbs**

Bad carbs, often referred to as simple carbohydrates, are typically found in processed foods, especially foods containing refined grains and added sugar.

Examples: sweets, cookies, cakes and pastries; bread, rice, sweetened drinks, alcohol.

These are simple carbohydrates. They are quickly absorbed, leading to spikes in blood sugar and subsequent crashes, which can cause fatigue and increased hunger.

Note that white potatoes, cassava, and taro should be limited. We would not give them the title of 'bad' because they are natural food sources and not addictive like sugar, but they still carry a high carb load.

## **Effects of carbohydrate overload**

### **Sugar**

Sugar is one of the greatest contributors to carbohydrate overload. Sugar is addictive.

Processed sugar, (white or brown), contains no vitamins or minerals. It is pure carbohydrate, (sucralose).

Raw sugar, the sweet liquid that comes directly from the sugar cane plant without being processed, contains some vitamins and minerals but is still high in carb. Raw and brown sugar that you buy in the supermarket are devoid of minerals.

Sugar raises blood sugar very quickly. Unless used by the body through exercise, the body stores it as fat. Sugar also is the greatest cause of tooth decay.

## **Wheat**

Wheat is very high in starch. Once digested, if not used through exercise, it turns to sugar and gets stored in the body as fat. Modern-day wheat is a hybrid, developed to get a higher yield. Ancient wheat was not nearly as high in starch or gluten. Modern wheat is very high in gluten. Many are becoming gluten intolerant. The wheat that was grown and consumed in Bible times was very different to wheat today. It was high in protein and contained many more vitamins and minerals than today's wheat. Ancient wheat gave complete sustenance.

## **Activities**

1. List 3 foods containing complex carbohydrates.
2. List 3 simple complex carbohydrates.
3. Make a comparison of 'good carbs' and 'bad carbs'.
4. List 3 bad side-effects of sugar.
5. What is the difference between the bread of today and the bread that Jesus ate?
6. When Jesus said, "Man shall not live by bread alone", what did He mean? (Matt 4:4)
7. In the light of bread in Biblical times giving maximum sustenance, explain what people in Bible times would have understood by Jesus' words, "I am the bread of life." (John 6:35)

## **2. Protein**

Proteins are the building blocks for growth and repair of tissues, including muscles, skin, and organs. They also play a role in hormone production and immune function. While protein can provide energy, its primary role is not energy production but rather supporting growth and maintenance of body structures.

Examples of protein foods:

- Meat, fish, eggs, dairy products, nuts, and seeds, legumes

Things to note:

- Legumes (lentils, dried beans) are approximately 50% carb and 50% protein).
- Nuts contain fats and carbohydrates as well as protein.
- Meat and fish provide the highest amount of protein.

### **Activities**

1. List 3 roles of protein uptake in the body.
2. Make a list of high-protein foods.
3. Give an example of a foods containing moderate amounts of protein.

## **3. Fats**

Fats provide the most concentrated source of energy. They are essential and are crucial for various bodily functions. Fats help in the absorption of fat-soluble vitamins (A, D, E, K), provide insulation against the cold, protect vital organs, and are involved in hormone production. They also contribute to cell membrane structure. There are 'good fats' and 'bad fats'.

### **Types of fats**

Fats can be also be classified into:

- Saturated – found in animal meats, butter/cream, coconut oil
- Unsaturated – found in olive oil, vegetable oils, avocados, and fish
- Trans fats – fats that have been chemically altered, found in margarine, processed fried or baked foods, such as potato crisps and pastries.

Until about 15 years ago, it was thought that saturated fats were good, and unsaturated fats were bad. Now we know that this is not true.

Coconut oil, butter and meat fats are good fats, even though they are saturated. They are protective and provide vitamins A, D, E and K. You can cook with these fats.

We now know that many unsaturated fats are bad fats, because they have been heated to high levels making them carcinogenic. That means they have the potential to cause cancer.

Examples of bad fats include margarine and all cooking oils in plastic bottles such as canola oil, peanut oil, soy oil. Do not cook with these fats. (Only olive oil in dark glass bottles is safe.)

Unfortunately, it takes a LONG time for revealed truth to be taken up by the public and even by some in the medical profession. This is partly due to manufacturers who continue to promote foods like margarine as heart-healthy in order to make sales.

### **Activities**

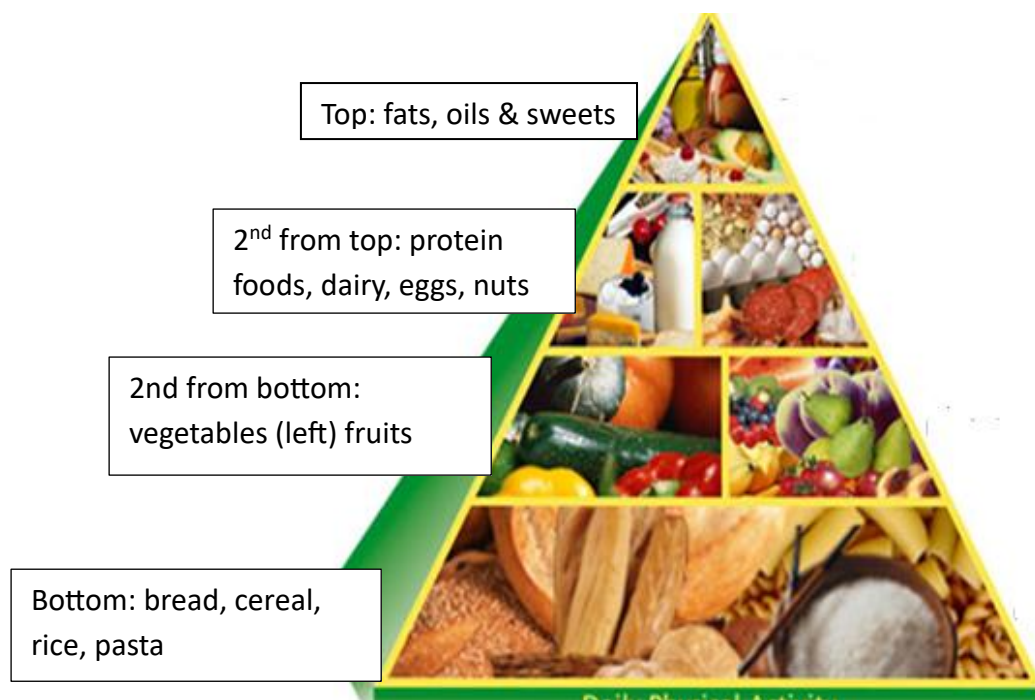
1. List the 3 categories of fats and 2 examples of foods in each category.
2. List 3 examples of good fats.
3. List 3 examples of bad fats.

4. Why are 'bad fats' bad?

5. Butter was once called a 'bad fat' but is now called a 'good fat'. Why?

## The 1992 Food Pyramid - More myths from the past

After 20 yrs of advising people to follow the 1992 pyramid, metabolic disease sky-rocketed. In 2018, in the USA, only 1 in 14 adults had optimal metabolic health.



### What's wrong with the 1992 food pyramid?

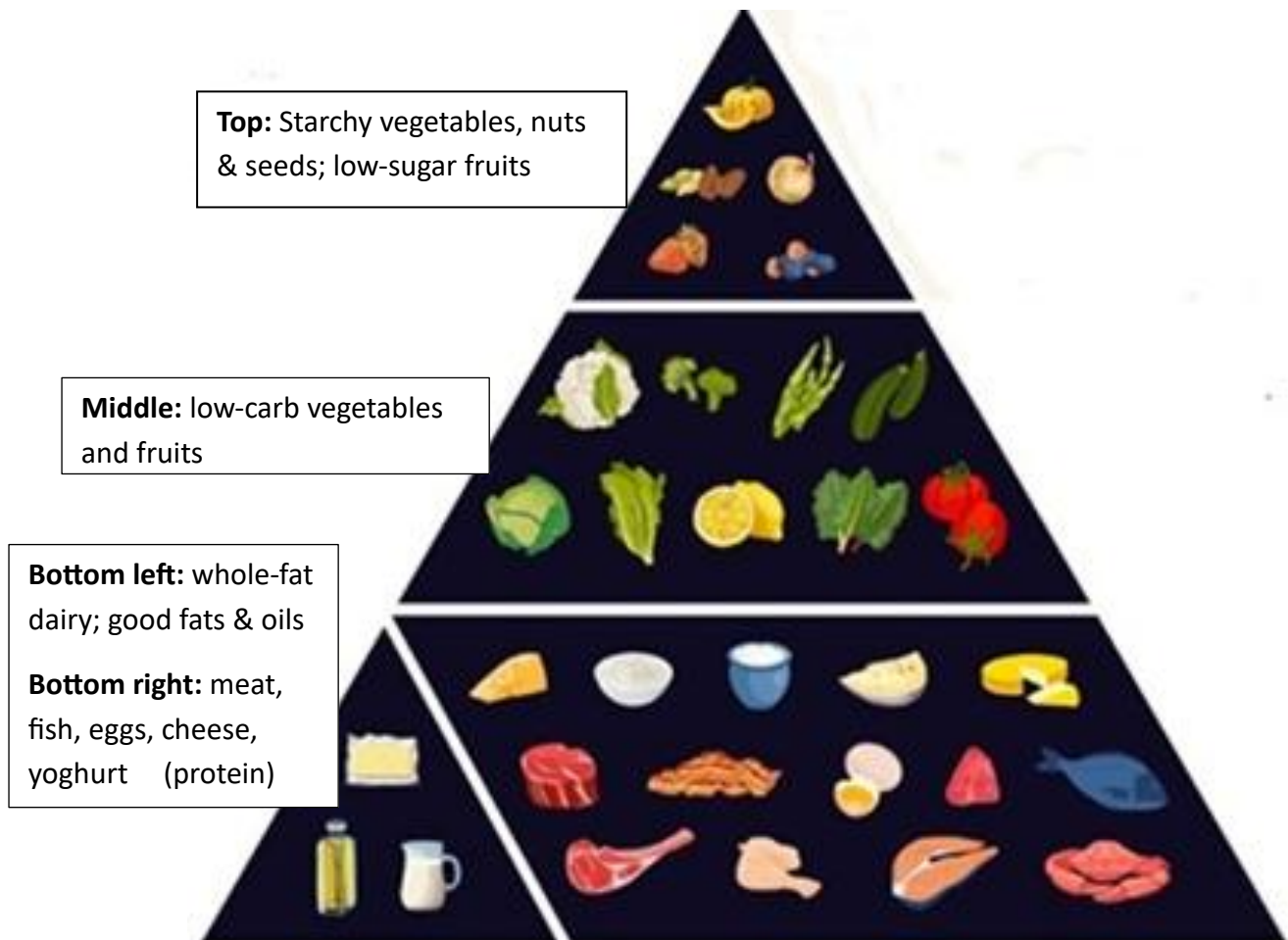
1. Too many carbs on the bottom section. Adults do not need this percentage of carbs.
2. We do not need as much fruit as shown in the second layer.
3. We need more protein and fat than is shown in the third layer.
4. We do not need any sugary sweets as shown in the top layer.

### Activities

1. Write a paragraph explaining what's wrong with the 1992 food pyramid.
2. What type of foods should be on the bottom layer?
3. What kind of protein foods are shown in the pyramid?
4. How could the protein section be improved?

## The New Food Pyramid - for most adults

In 2025 a research paper showing a new food pyramid was published. This is now recommended for optimal metabolic health for the average adult. The carbohydrate content has been drastically reduced and the protein content increased. But note that children and manual/farm workers need more good carbs, (top level), than average adults because they expend more energy.



- **Top level:** starchy vegetables, low-sugar fruit & nuts
- **Middle level:** non-starchy vegetables
- **Bottom level:** whole-fat dairy, good fats, meats, fish, eggs

**What is optimal metabolic health?** This is when a person has GOOD key metabolic health markers:

- Acceptable weight-to-height ratio
- Normal blood glucose levels
- Normal levels of fat in the blood
- Normal levels of good (HDL) cholesterol
- Normal blood pressure

## **Taking a closer look at the new food pyramid ...**

**Bottom Level** - eat most - protein and fats

- Meat – red meat, chicken
- Fish – better to buy fresh and cook it. Tinned tuna contains mercury. However, tinned sardines are good. Salmon is OK.
- Dairy – cheese, milk, yoghurt. Make sure the yoghurt is full-fat and has NO flavouring or sugar.
- Eggs
- Good fats – butter, cream, olive oil (in dark glass bottles), coconut oil

**Middle Level** - eat moderately - non-starchy carbs

- green leafy vegetables – cabbage, spinach, lettuce etc.
- capsicum, egg plant
- tomatoes, zucchini
- cucumber, celery
- legumes - beans, peas, lentils)
- cauliflower, broccoli
- avocados, coconut

**Top level** - starchy carbs and fruit - Limit these:

- pumpkin
- corn
- potatoes
- sweet or starchy fruits – e.g. bananas, mangoes

**Foods not included in the new food pyramid, (foods to be avoided)**

- Sugary sweets
- Bread
- Cakes, biscuits and sweet desserts
- Pastries
- Rice and pasta
- All kinds of “junk food” and processed take-away foods

## The Upside-down food pyramid

Some nutritionists suggested that the 1992 Food Pyramid should be turned upside-down. Here is another example of a reformed Food Pyramid:



Note that the quantity of protein food has been increased, there are more good fats and more coloured vegetables. The bread and rice at the bottom are very minimal.

### Activities

1. How are the two examples of the new food pyramid different from the 1992 food pyramid?
2. What adjustment should be made for children and people involved in hard physical work?
3. What is optimal metabolic health?
4. Using the first new food pyramid (black background), make a table with 3 columns: bottom, middle, top), and list the foods that should go in each column.
5. When buying tinned fish, why are tinned sardines or salmon a better choice than tuna?

## How much carbohydrate do we need per day?

For adults on a low-carb diet we need 125g carbohydrate or less.

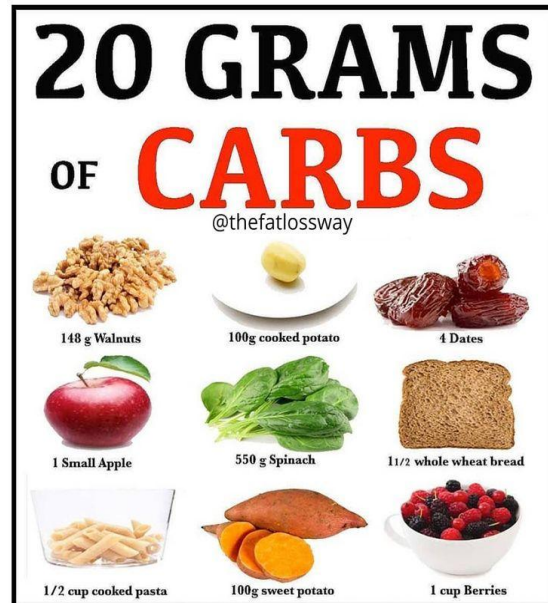
### Why limit carbs?

Carbs are an energy source for us to use while active. If you are not doing a lot of exercise, the unused carbs get stored as fat.

### What does 20g of carb look like?

(6 of these could make a day's intake)

- 1 cup of walnuts
- ¼ cup cooked potato
- 4 dates
- 1 small apple
- 3 cups cooked spinach
- 1 ½ slices whole wheat bread
- ½ cup cooked pasta
- ¼ cup cooked sweet potato
- 1 cup berries



## How much protein do we need per day?

A good way to work out your protein requirements is: Your height (in cm) minus 100.

e.g. If you are 160 cm tall, you need 60 g of protein.

(Note that athletes and physical labourers need more.)

Good protein sources: meat, fish, dairy products, eggs, nuts, legumes

### What does 30g of protein look like?

- 130 g chicken (size of your palm)
- 130 g steak (as above)
- 5 eggs (6 g per egg)
- 120 g cheese (1/2 cup grated)
- 225 cottage cheese (1 cup)
- 320 g cooked legumes/lentils (2 cups)
- 330 g yoghurt (1½ cups)
- 115 g canned fish (1 can)
- 166 g (1 cup) tempeh
- 350 g (1 ½ cups) tofu

(3 of these could be a days' intake.)



### How much fat do we need per day?

We need approx. 100 to 130 g. of fat per day.

For weight control, eat fat with protein and not with carbohydrates. For examples, meat/fish with salad or low-carb coloured vegetables. Dark chocolate is okay on a low-carb diet if it's at least 80% raw cacao. (It contains less sugar.)

### What does 30g of fat look like? (4 of these for a day's intake)

- Avocado – 1 whole
- Coconut – ¾ cup
- Salmon – 1 cup
- Olive oil – 3 tablespoons
- Almonds – 1/3 cup
- Walnuts - ¼ cup
- Butter – 3 tablespoons



## Challenge: Meal Planning – Carbs and Protein

Make meal plans for a day, focusing on getting the right amount of carbs and protein. Plan for breakfast, lunch, dinner (no snacks).

Choose the foods, in the correct quantities, to give you the right amount of carbs and protein for a day.

Based on the following information showing quantities of protein, carb and fat, make meal plans for a day – 2 or 3 meals (no snacks).

Choose the foods you would like to eat, in the correct quantities, to give you the right amount of protein and good carbs.

Use the Food Analysis Chart on pages 14-16 for a wider variety of foods.

### Carbohydrates: recommended – 125g per day

#### Example of a one-day carb intake for 125 g of carb

| Food type                             | Grams of carb |
|---------------------------------------|---------------|
| 1 cup cooked oats                     | 28            |
| 1 small apple                         | 20            |
| 4 cups salad greens                   | 5             |
| 1 cup assorted non-starchy vegetables | 11            |
| ¼ cup raw nuts                        | 5             |
| ½ cup cooked legumes/ lentils         | 21            |
| ¼ cup sweet potato                    | 27            |
| <b>Total carbs:</b>                   | <b>125</b>    |

### Protein: recommended – approx. 70 – 90 g

(or your height minus 100)

#### Examples of a one-day protein intake in grams:

| Food type                                             | Grams of protein |
|-------------------------------------------------------|------------------|
| 2 eggs                                                | 12               |
| 1 piece chicken                                       | 30               |
| ½ cup sardines                                        | 15               |
| ½ cup cooked lentils                                  | 8                |
| 1 protein shake (with protein powder & ½ cup yoghurt) | 25 g             |
| <b>Total Protein:</b>                                 | <b>90 g.</b>     |

### Food analysis chart – Protein, Carbs, Fat

| Food                      | Measure          | Weight (g) | Protein (g) | Carbs (g) | Fat (g) |
|---------------------------|------------------|------------|-------------|-----------|---------|
| <b>Dairy</b>              |                  |            |             |           |         |
| Cheese, cheddar           | 3 cm cube        | 20 g       | 5           | 0         | 7       |
| Cheese, Cottage           | Half cup         | 114        | 13          | 4         | 4       |
| Yoghurt, plain whole milk | 1 cup            | 245        | 9           | 11        | 8       |
| Milk, whole milk          | 1 cup            | 244g       | 8           | 11        | 8       |
| <b>Fats, oils</b>         |                  |            |             |           |         |
| Butter                    | 1 tblsp.         | 14         | 0           | 0         | 11      |
| Olive oil                 | 1 tblsp.         | 14         | 0           | 0         | 14      |
| Coconut oil               | 1 tblsp.         | 14         | 0           | 0         | 14      |
| <b>Fruit &amp; nuts</b>   |                  |            |             |           |         |
| Banana                    | 1 large          | 152        | 2           | 36        | 1       |
| Grapes                    | 1 cup            | 160        | 1           | 28        | 1       |
| Kiwi fruit                | 1                | 76         | 1           | 11        | 0       |
| Orange                    | 1                | 151        | 1           | 17        | 0       |
| Apple                     | 1                | 150        | 1           | 25        | 0       |
| Pear                      | 1                | 122        | 1           | 13        | 0       |
| Peach                     | 1                | 157        | 1           | 17        | 0       |
| Strawberries              | 1 cup            | 144        | 1           | 10        | 1       |
| Raspberries               | 1 cup            | 123        | 1           | 14        | 1       |
| Papaya                    | 1 cup<br>(cubes) | 140        | 1           | 14        | 0       |
| Pineapple                 | 1 cup<br>(cubes) | 210        | 1           | 21        | 0       |
| Mango                     | 1 whole          | 207        | 1           | 35        | 1       |

| <b>Food</b>             | <b>Measure</b>       | <b>Weight (g)</b> | <b>Protein (g)</b> | <b>Carbs (g)</b> | <b>Fat (g)</b> |
|-------------------------|----------------------|-------------------|--------------------|------------------|----------------|
| Guava                   | 1 cup                | 165               | 1                  | 20               | 1              |
| Passionfruit            | 1                    | 18                | 0                  | 4                | 0              |
| Lemon                   | 1                    | 100               | 0                  | 5                | 0              |
| Dates                   | Half cup             | 89                | 2                  | 65               | 1              |
| Dates                   | 1                    | 8                 | 0                  | 6                | 0              |
| Almonds                 | Half cup             | 71                | 15                 | 14               | 36             |
| Coconut - fresh         | Half cup             | 45                | 1                  | 5                | 13             |
| <b>Starches/grains</b>  |                      |                   |                    |                  |                |
| Bread, wholegrain       | 1 slice              | 26                | 3                  | 12               | 1              |
| Pasta-spaghetti         | 1 cup<br>(cooked)    | 140               | 7                  | 40               | 1              |
| Oats (cooked)           | 1 cup                | 150g              | 6                  | 28               | 6              |
| <b>Meat, Fish, Eggs</b> |                      |                   |                    |                  |                |
| Beef steak              | 1 portion            | 85                | 24                 | 0                | 17             |
| Lamb                    | 1 portion            | 85                | 21                 | 0                | 18             |
| Chicken (breast)        | 1portion             | 85                | 21                 | 0                | 0              |
| Chicken (drumstick)     | 1medium              | 90                | 19                 | 0                | 10             |
| Fish- salmon            | 1 piece<br>(cooked)) | 85                | 22                 | 0                | 4              |
| Fish - flounder         | 1 piece<br>(cooked)  | 85                | 17                 | 0                | 10             |
| Fish – sardines         | 1 can                | 85                | 21                 | 0                | 10             |
| Eggs, boiled            | 1                    | 50                | 6                  | 1                | 5              |
| <b>Vegetables</b>       |                      |                   |                    |                  |                |
| Broccoli                | Half cup             | 36                | 2                  | 4                | 0              |
| Cauliflower             | Half cup             | 54                | 1                  | 2                | 0              |

| <b>Food</b>                      | <b>Measure</b> | <b>Weight (g)</b> | <b>Protein (g)</b> | <b>Carbs (g)</b> | <b>Fat (g)</b>        |
|----------------------------------|----------------|-------------------|--------------------|------------------|-----------------------|
| Carrots raw                      | Half cup       | 64                | 0.5                | 6.5              | 0                     |
| Tomato                           | 1              | 62                | 1                  | 3                | 0                     |
| Pumpkin                          | Half cup       | 122               | 1                  | 9                | 0                     |
| Potato (white cooked)            | 1 cup          | 242               | 4                  | 37               | 3                     |
| Sweet potato (cooked)            | 1 cup          | 256               | 5                  | 58               | 4                     |
| Chick peas /dried beans (cooked) | 1 cup          | 240               | 12                 | 54               | 1                     |
| Red lentils (cooked)             | 1 cup          | 198               | 18                 | 40               | 1                     |
| Avocado                          | Half cup       | 75                | 1.5                | 5.5              | 11.5                  |
| Green beans                      | Half cup       | 83                | 1                  | 6                | 0                     |
| Sweet corn                       | 1 whole        | 77                | 3                  | 19               | 1                     |
| Cabbage                          | 1 cup          | 89                | 1                  | 5                | 0                     |
| Celery                           | 1 cup          | 150               | 1                  | 5                | 0                     |
| Cassava                          | 1 cup          | 206               | 3                  | 78               | 1                     |
| Lettuce                          | 1 cup          | 55                | 1                  | 1                | 1                     |
| Spinach                          | Half cup       | 90                | 3                  | 3                | 0                     |
| Capsicum                         | 1 whole        | 148               | 1                  | 7                | 0                     |
| Cucumber                         | 1 whole        | 201               | 1                  | 5                | 0                     |
| Egg plant                        | 1 piece        | 50                | 1                  | 6                | 0                     |
| Peas                             | Half cup       | 80                | 4                  | 11               | 0                     |
| Okra                             | Half cup       | 92                | 2                  | 5                | 0 (add for olive oil) |
| Zucchini                         | 1 medium       | 196               | 0                  | 7                | 0                     |

# What does the Bible say about food?

## **Our bodies belong to Christ**

Our bodies are temples of the Holy Spirit. “Do you not know that your body is a temple of the Holy Spirit, who is in you, whom you have received from God?” (1 Cor 6:19)

Further more ... we are not our own but have been bought with a price. (1 Cor 6:20)

If God is to use us in His service, then we need to be healthy and energetic in order to do His will. Also, showing self-control and discipline are Godly attributes which are part of developing Christian character. When we give our whole life to Christ, that should mean giving our body, soul and spirit. The Bible tells us to put off the attributes of the ‘old self’ and to put on the ‘new self’, (Col 3:9-10). When we make Jesus Lord of our whole life it is our responsibility to surrender undesirable habits relating to our bodies.

## **The meaning of freedom from the law**

We are called to be free! ... “but do not let this freedom become an excuse for letting your physical desires control you.” (Gal 5:13 GNB)

In the Old Testament people were obliged to follow all kinds of ceremonial food laws. These were given to the Jews before the coming of Christ to keep them as a distinct people. Under the new covenant, Christians obey God out of love for Him and are not tied down to following ceremonial laws. However, if we really love the Lord with all our heart, mind, soul and strength, we will want to keep our bodies fit for His service.

We are free in Christ because Jesus has freed us from the bondage of sin, when we give our lives to Him. Our new life in Christ is one of joy, but not one of irresponsibility. One of the fruits of the Spirit is self-control, (Gal 5:22). As with the production of real fruit, the fruit growing requires our attention, effort and input. The fruits of the Spirit are different from the gifts of the Spirit, which are given without measure. The production of fruit in the lives of Christians requires a response on our part. As we make Jesus Lord of our life the fruit will be evident.

## **Reflection**

1. What does it mean for a Christian to be bought with a price?
2. Write a paragraph on the phrase, ‘fit to serve’.
3. In relation to food choices, what could be some examples of habits of ‘the old self’ compared to ‘the new self’?
4. Concerning food, explain the difference between the Old Testament requirement to follow ceremonial food laws, and the requirements for Christians in the New Testament.

# Cholesterol

## What is cholesterol?

Cholesterol is a waxy substance found in the blood that is essential for building healthy cells, (a type of fat). It is produced by the liver and is also obtained from certain foods.

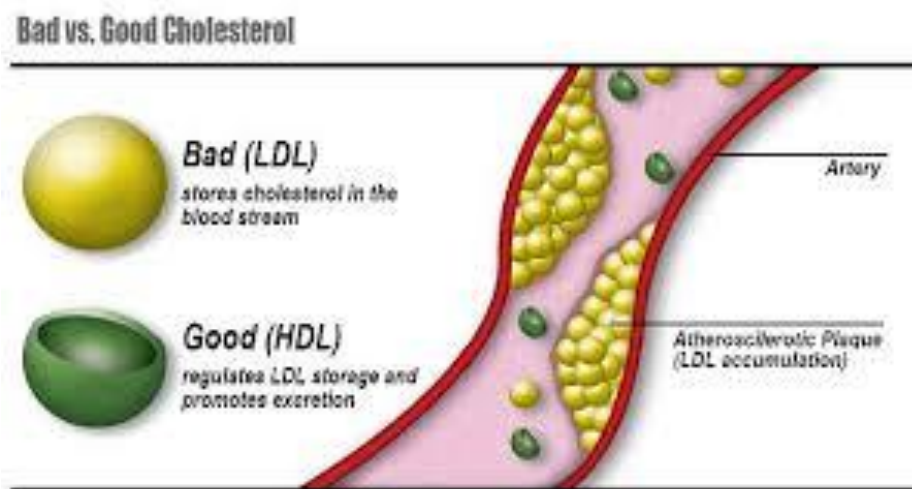
Cholesterol plays a crucial role in various bodily functions, including the formation of cell membranes and the production of hormones. There are different types of cholesterol, including "good" HDL cholesterol and "bad" LDL cholesterol.

HDL stands for *high-density lipoprotein* ('Good' Cholesterol)

LDL stands for *low-density lipoprotein* ('Bad' Cholesterol)

## Why we need it

Cholesterol is made by the body for a purpose. LDL is often called "bad cholesterol". Nothing the body makes is BAD. It has a purpose. That is to repair the inside of the blood vessels.



From the diagram, note that LDL collects on the walls of the arteries whereas HDL flows through the middle.

## Activities

1. What is cholesterol?
2. What do the letters HDL and LDL stand for?
3. Draw the diagram using colour, to show the difference between the effects of HDL and LDL cholesterol on the arteries.

## **Benefits of LDL cholesterol ((Low-density lipoprotein)**

If we did not have LDL cholesterol to plug up damage to the arteries, a person would bleed internally, into the tissues such as the heart or brain causing a stroke or brain haemorrhage.

## **How does the arterial wall become damaged?**

Why does it need to be repaired? Here are some possible causes of arterial wall damage:

- Trans fats found in many processed high-carb foods such as fast food; cheap cooking oils in plastic bottles, such as canola oil and peanut oil
- Toxins – chemicals in the home, in food and in personal care products that we put on our skin; environmental toxins such as heavy metals like mercury, lead and aluminium
- Mould
- Drugs including pharmaceutical drugs
- Smoking and alcohol

All these can create little holes in the arterial wall. This is when the LDL cholesterol goes to the site of the damage and uses plaque to plug up the hole.

## **Danger! Too much LDL!**

If the deposit of plaque continues, too much plaque will stop the flow of blood through the arteries, causing high blood pressure, heart attack, stroke.

A low-carb diet is crucial for keeping the arteries in good shape. Keep away from processed foods that contain the bad fats, such as chips, margarine and cookies. This will assist in keeping a good balance between the LDL and HDL cholesterol.

## **Benefits of HDL cholesterol**

HDL cholesterol helps clean up unwanted LDL cholesterol and transports it to the liver for disposal.

### **Activities**

1. Explain the benefits of both HDL and LDL cholesterol.
2. What is the danger of too much LDL cholesterol?

## **Myths about the causes of high LDL cholesterol**

The following DO NOT cause high LDL cholesterol, as shown by new research.

1. Eating foods containing saturated fat
2. Eating eggs
3. Eating foods with high cholesterol

## **Other factors contributing to high LDL cholesterol**

- Being overweight
- Psychological/emotional stress
- Smoking
- Certain Medications
- Pregnancy (linked with gestational diabetes)
- Genetics

## **What if the doctor says a person's LDL is too high?**

They will probably be given Statin drugs. But there are many associated risks with Statins. Statins block the pathway to the liver where cholesterol is made, so the body can't make it – that means it also can't make HDL.

Statin drugs also stop the making of CoQ10 which is a protective enzyme for the heart, so Statins may in some cases increase risk of heart attack.

## **Is there another way?**

Prevention is the best policy. Eat more heart-healthy fats such as butter, avocados, almonds, flaxseeds, and fatty fish regularly. Do not eat anything containing trans fats. Do not eat deep fried foods such as chips, that may have been fried in cheap cooking oil. Do not cook with vegetable oil, canola oil, peanut oil or similar available in plastic bottles. Use olive oil or coconut oil instead. Never buy or eat margarine.

- Take on a low-carb diet. Stay away from sugar and white carbs. High sugar intake is linked to low HDL.
- Exercise - Even brisk walking for 30 minutes a day can significantly raise HDL.
- Quit Smoking - benefits start within weeks.
- Quit alcohol
- Lose Visceral Fat - Focus on waist circumference, not just weight. A healthy waist size reduces inflammation and improves HDL-LDL ratios.

## **Activities**

1. What does NOT cause high LDL cholesterol?
2. What does cause high LDL cholesterol?
3. What is the problem with statin drugs?
4. What is the best way to prevent high LDL cholesterol?

# Cortisol

## What is cortisol?

Cortisol is a hormone that controls our stress response.

A hormone is a chemical messenger.

In this case it tells our body how to respond to stress.

## Fight or Flight

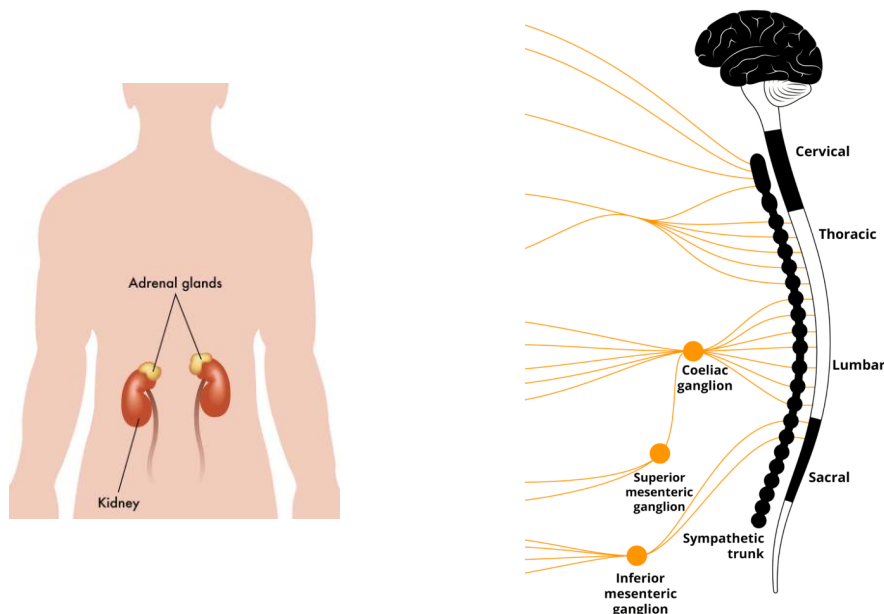
When we are under stress, or in the face of danger, the body has an amazing ability to provide enormous short-term strength to cope with what's to come.

What triggers the fight or flight response?

The fight response is triggered by anger; the flight response is triggered by fear.

## The Sympathetic Nervous System

Nerves are located in the lumbar region of the spine, (the lower back). Its role is to “turn things on”.



These nerves send a message to the adrenal glands to release two hormones: adrenaline and cortisol. (Note that the adrenal glands sit on top of the kidneys.)

- Adrenaline increases alertness.
- Cortisol is to increase levels of sugar (glucose), in the bloodstream to give us energy for the situation.

## The Body's Response to Cortisol

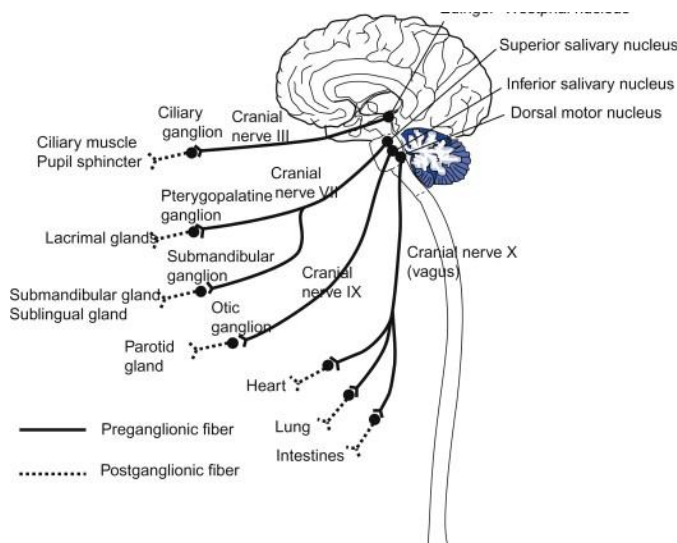
When released, Cortisol causes an increase in all of the following:

- heart rate
- blood pressure
- blood sugar
- muscle tension

## The Parasympathetic Nervous System

The Parasympathetic Nervous System, located at the base of the brain, “turns things off”. It calms you down and brings you back to normal again. Once the threat is out of the way, the adrenal glands stop releasing Cortisol and Adrenalin.

- Heart rate now normal.
- The digestive and the immune systems now normal.
- The body's ability to heal is able to take place.
- Reproductive function is now normal.



## Constant Stress

When we are under constant stress, the adrenal glands are constantly pumping out Cortisol and Adrenalin. The parasympathetic nervous system does not get a chance to do its job. The joints and spine are being stressed and prevent proper signals getting to the brain. The body does not make healing a priority and reduces repair, leading to weakened tissues. This can lead to “burn out”.

## Activities

Explain the roles and difference between the sympathetic and parasympathetic nervous systems. Draw diagrams.

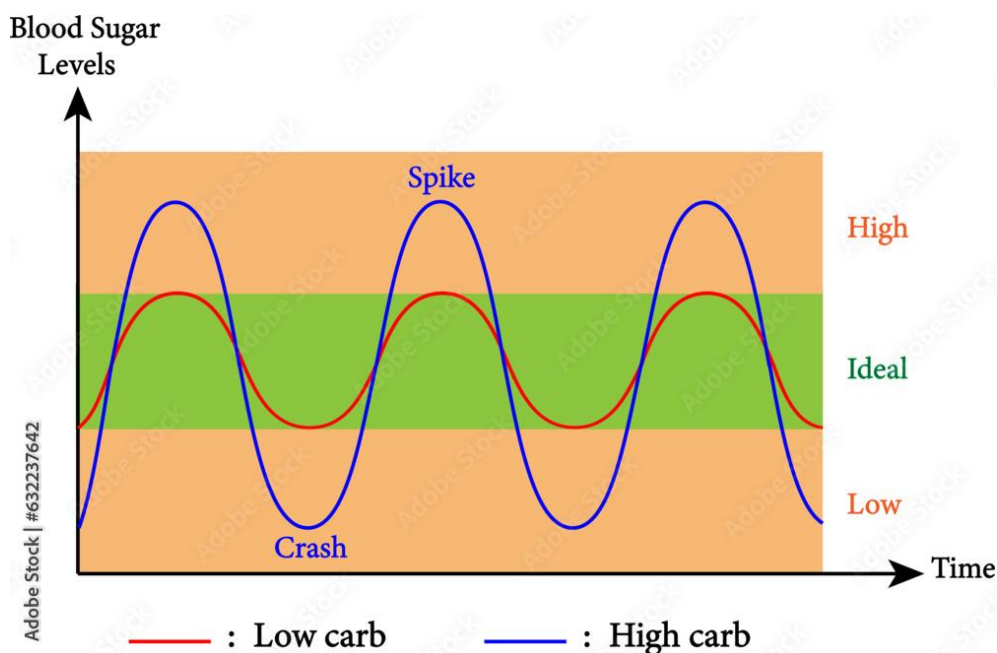
## More consequences of stress

Remember that the job of cortisol is to increase levels of sugar (glucose), in the bloodstream?

The body keeps getting the message that you need to refuel after the stressful event, (which is ongoing because you are under constant stress.)

So you do as your body says, and eat sugar, (and you crave it constantly because you are constantly under stress.)

This results in constant highs and lows in energy, wearing out the pancreas.



## Symptoms of Stress Response

- Tendency to gain fat around the middle
- Increased appetite
- Increased cravings especially sweets and carbs, caffeine and alcohol
- Energy slump in the afternoon
- Low functioning immune system – colds, infections
- Headaches
- Nail biting, Teeth grinding
- High LDL cholesterol
- Blood sugar swings
- Digestive problems
- Hair loss
- Irregular or absent periods

- Difficulty concentrating / forgetfulness
- Depression

Disease can have emotional roots. Stress may be a major contributor to the following:

- Cardiovascular diseases
- Gastrointestinal disorders (e.g. irritable bowel syndrome; stomach ulcers)
- Respiratory issues (asthma)
- Skin conditions (eczema)
- Cancer

## **The way out**

People with the above health problems can take action on 3 levels:

- Nutrition – Eat nutritious natural foods.
- Exercise – Create a daily exercise routine.
- Emotional and spiritual support – The God of the Bible tells us that we can call upon him in times of need and he will answer. People with chronic health issues can get help from trusted Christian friends who can pray with them.

## **Some Bible verses for people with physical needs:**

### **Asking God to supply your needs:**

If you believe, you will receive whatever you ask for in prayer. (Matthew 21:22)

And I will do whatever you ask in my name, so that the Son may bring glory to the Father. You may ask me for anything in my name, and I will do it. (John 14:13-14)

Ask, and it will be given to you; seek and you will find; knock and the door will be opened to you. For everyone who asks receives; he who seeks finds; and to him who knocks, the door will be opened. (Matthew 7:7-8)

If you remain in me and my words remain in you, ask whatever you wish and it will be given you. (John 15:7)

Nothing is impossible with God. (Luke 1:37)

This is the confidence we have in approaching God: that if we ask anything according to His will, He hears us. (1 John 5:15)

### **Asking God for healing:**

Praise the Lord O my soul, and forget not all His benefits – who forgives all your sins and heals all your diseases. (Psalm 103:2-3)

He (Jesus) was pierced for our transgression, He was crushed for our iniquities; the punishment that brought us peace was upon Him, and by His wounds we are healed. (Isaiah 53:5)

## **Emotional stress – a contributor to physical illness**

When we experience stress, our bodies release stress hormones such as cortisol and adrenaline. While this response is beneficial in short bursts—like preparing for a presentation—it can lead to detrimental health effects if sustained over time. Common physical symptoms of prolonged stress include:

- Headaches
- Muscle tension
- Digestive issues
- Fatigue
- Sleep disturbances

## **Physical Health Issues Linked to Chronic Stress**

- Cardiovascular Diseases: Chronic stress contributes to hypertension and inflammation, increasing the risk of heart attacks.
- Digestive Disorders: Stress can lead to conditions like irritable bowel syndrome (IBS), ulcers, and excessive weight gain due to hormonal deregulation.
- Immune System Compromise: Prolonged stress can weaken the immune response, making the body susceptible to illnesses.

## **Emotional stress can be caused by underlying unresolved problems**

### **Some practical strategies of ways to deal with personal problems:**

- Forgive others where forgiveness is necessary. Do not harbour unforgiveness in your heart. Bitterness leads to ill-health. (See Matt 6:14-15 & Col 3:13)
- Don't hold on to guilt. Ask for God's forgiveness, forgive yourself and move on.
- Put aside feelings of inadequacy and inferiority. Remember that you are precious to God and he has a unique purpose for you. Put your trust in him and he will open up a new path. (See Psalm 139.)
- Pray with others about your problems.
- Don't give up!

Remember – “I can do all things through Christ who strengthens me!” Philippians 4:13

## **Activities**

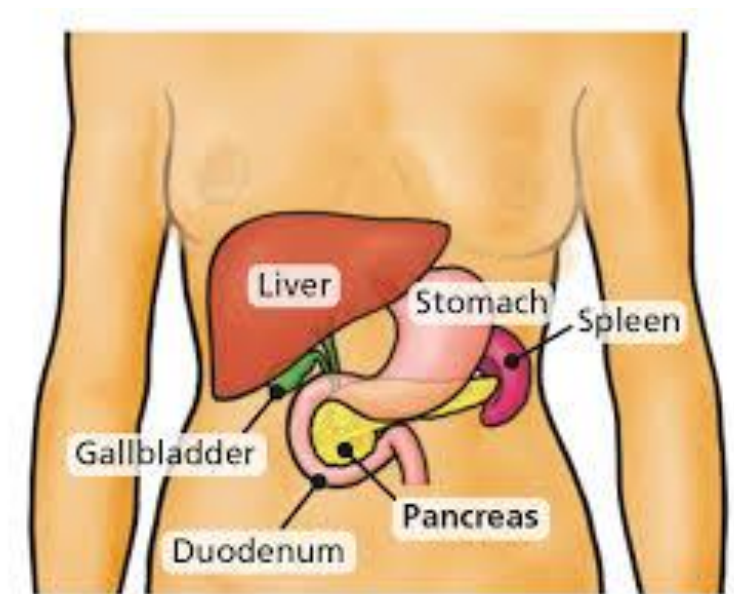
1. List the symptoms of increased stress response.
2. List ways to deal with stress.

# Insulin Resistance

## What is insulin?

Insulin is a hormone that your pancreas makes, essential for regulating blood sugar levels. Insulin helps move glucose from your blood into your cells so your body can use it for energy.

Insulin is made in the pancreas and regulates blood sugar.



## What is Insulin resistance?

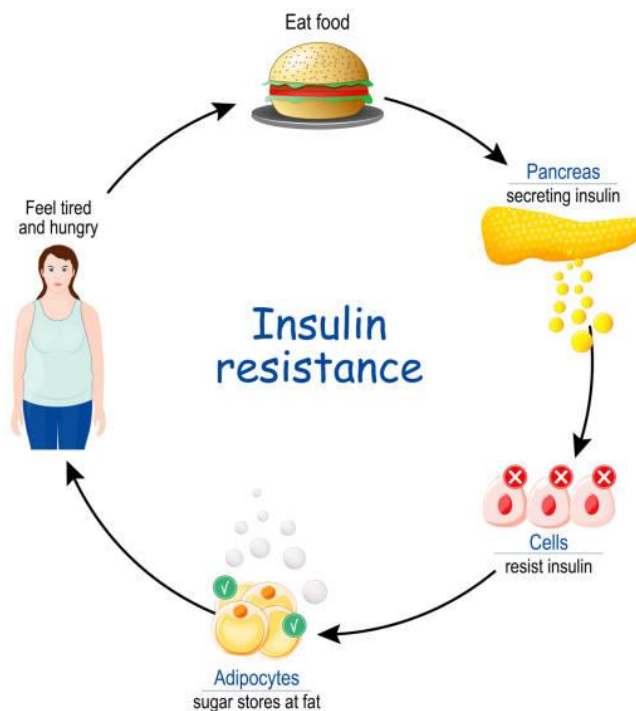
Insulin resistance is when the body doesn't respond as it should to insulin. The pancreas works harder by making more and more insulin to help keep the blood glucose levels in a healthy range. Over time, the pancreas can wear out, and produces less and less insulin, leading to high blood sugar levels.

**This can eventually lead to type 2 Diabetes.**

## Activities

1. What is insulin and what is its role?
2. Copy the diagram and highlight the pancreas.
2. What is insulin resistance?

## Steps in the Insulin Resistance Cycle:



1. The person eats a high-carb meal, (top of the diagram).
2. The pancreas secretes insulin in response to glucose. (Glucose is sugar in food or starch that has converted to sugar).
3. The insulin allows cells throughout the body, particularly in the muscles, to absorb glucose from the bloodstream. Cells normally use this glucose as their main source of energy. metabolism. But in this case the cells are resisting the insulin. So instead of keeping your blood sugar levels stable and within a healthy range, your blood sugar levels will rise.
4. Because the glucose cannot be properly used by the cells, it gets stored as fat.
5. Fat builds up particularly around the waist.

## Some symptoms of uncontrolled blood sugar

Resulting Medical Conditions:

- Hyperglycaemia (high blood sugar)
- Pre-diabetes
- Diabetes

Note: Some people can be prediabetic without having symptoms

## Activities

Draw the insulin resistance diagram. Summarize the steps.

## **Diabetes Type 1**

(Not cause by lifestyle)

This type of Diabetes often begins in late childhood, but can occur at any age. It is the rarer form, (10% of all diabetics) but the more dangerous form. The pancreas loses its ability to make insulin, so insulin injections must be given, (for life). It is an autoimmune disease that occurs when the immune system mistakenly attacks and destroys the insulin-producing cells in the pancreas, leading to a lack of insulin production.

## **Diabetes Type 2**

(A lifestyle disease)

This is late-onset diabetes, (although it is more recently seen in younger adults). The problem initially is not with the pancreas, but with the insulin receptors on the cell surfaces of certain body tissues, especially muscle tissue. The pancreas must work hard to increase insulin output to compensate, and eventually pancreatic function can fail.

## **Complications of uncontrolled blood sugar**

- Heart disease or heart attack
- Stroke
- Kidney damage
- Nerve damage
- Eye damage
- Skin problems

The condition is also associated with:

- Obesity
- Liver disease (fatty liver)
- High blood pressure
- Polycystic ovary syndrome (PCOS)

## **The positive results of a lifestyle change**

Changing to a healthy lifestyle can ...

- Reduce insulin resistance
- Lower your blood glucose levels
- Decrease blood pressure
- Decrease LDL (“bad”) cholesterol levels
- Raise HDL (“good”) cholesterol levels

## **Foods to avoid**

- Sugar and foods that contain added sugar
- Sweet drinks, fruit juice and alcohol
- Bread
- Potatoes
- Breakfast cereals
- Cakes, pastries and cookies
- Very sweet fruits such as watermelon and dates

## **Can Type 2 Diabetes be reversed?**

Studies show it's possible for some people to reverse it. Through diet changes and weight loss, you may be able to reach and hold normal blood sugar levels without medication. Even if you're in remission, which means you aren't taking medication and your blood sugar levels stay in a healthy range, there's always a chance that symptoms will return.

So how can you reverse diabetes? The key seems to be weight loss. The odds of repairing the cells are best in the early stages (pre-diabetes).

(webMD.com)

## **Activities**

1. What medical conditions can result from insulin resistance?
2. What is the difference between Type 1 and Type 2 Diabetes?
3. What are the complications of Type 2 Diabetes?
3. What would a doctor give to a Type 2 Diabetes patient?
4. What is the meaning of 'pre-diabetic'?
5. What can a pre-diabetic person do to avoid progressing to Diabetes Type 2?
6. Can Diabetes Type 1 be reversed?
7. Can Diabetes Type 2 be reversed?

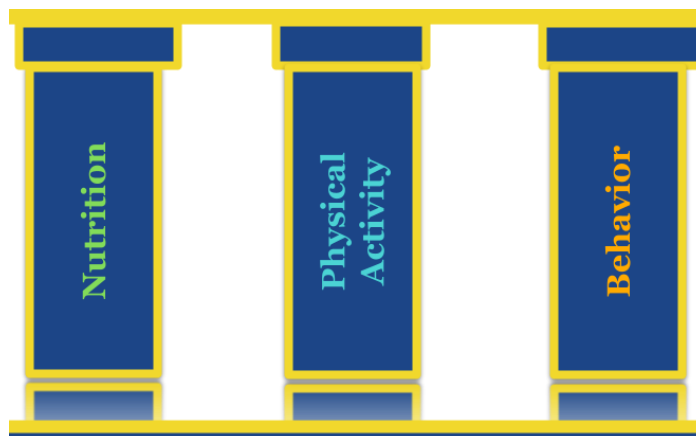
# Diets

People often say “I’m going on a diet”, to lose weight. The purpose for the diet is more about changing your physical appearance than optimal health. A diet that purely focuses on weight loss emphasises the quantity of food, (eating little), and not quality of the food. It is a short-term diet, to reach a goal. Once the person has reached that goal, they usually revert to their previous eating pattern.

## A healthy lifestyle

A lifestyle focuses on the eating the best nutrients. It is a balanced diet that can be sustained long-term. The goal is to practice healthy eating habits for life. It emphasizes both short-term and long-term health and focuses on eating foods that are enjoyable and satisfy hunger, but also nutritious.

### 3 pillars of a healthy lifestyle



1. Nutrition - taking control of the type of food that you eat; making sure you have the right balance of vitamins, minerals, carbohydrates, protein and fats
2. Physical Activity - regular exercise, at least 60 minutes per day
3. Behaviour - signing up for life-long healthy eating habits. This will take determination, self-control, motivation and a commitment. You practice it because you believe in it and want the best for your future.

### Some interesting statistics

Only about 5% of people who follow commercial diet programs actually lose weight and remain close to that weight. For most, one-third of the weight lost during dieting is regained

within one year after the person stops the program. Almost all the weight is regained after five years.

### **Nutrition Principles for optimal weight**

- Minimize starchy carbohydrates and sweet foods.
- Minimize meals that combine high-carb and high fat.
- Eat plenty of good quality protein and good fats
- Don't eat a large meal late at night. (Undigested food while sleeping means you are not burning your own body fat.)

### **Examples of foods combining high-carb and fat**



Baked goods and pastries combine flour, sugar and fat.



Tomato is a low-carb vegetable but not good when combined with chips or pizza, both of which are high-carb and high fat.

It's better to eat foods that combine protein and fat. These meals do not contribute to weight gain.

### **Activities**

1. What's the difference between 'going on a diet' and eating to maintain a healthy lifestyle?
2. Combining high-carb foods with fat causes weight gain. Think of some more foods, other than those shown, that combine high fat with sweet or starchy carbs.

## Examples of meals combining protein and fat



avocado with chicken



eggs with avocado & salad



steak with green veg and halloumi cheese

## Activities

1. Why are meals that combine protein and fat, but eliminate high carbs, a good option?
2. Think of some other meals or food choices that combine protein and fat.

## Are there “good” and “bad” foods?

Some people who promote special weight-loss “diets” say that there are no “good” or “bad” foods. This is because their program is only concerned about whether the food will put on weight or not. It involves complicated ‘calorie counting’.

People who devise these “diets” do not consider the quality of food. They would have no problem with margarine, oils in plastic bottles (which we know are ‘carcinogenic’). They would have no problem with foods containing artificial sweeteners. From a natural health perspective, these are “bad” foods.

Beware of “no added sugar”



Aspartame, an artificial sweetener contained in diet drinks is toxic to the brain.



Long-term use of artificial sweeteners such as saccharine, increases the risk of weight-gain. A person’s metabolism is affected by artificial or non-nutritive sweeteners. That means it affects the ability to burn fat.

## Is sugar a chemical weapon? Article by Louize Small, The Light Australia, Issue 6

People who want to avoid sugar in order to lose weight may choose to use artificial sweeteners instead. But how wise is that really? We may save ourselves some cavities but lab-created chemicals such as aspartame and saccharin can create a plethora of new diseases and chronic illnesses.

When sugar was first discovered it was used in its pure, natural form. As a wholefood, sugar cane is a complex carbohydrate containing essential trace minerals and can form part of a well-balanced diet. These days the crop undergoes such intensive processing that all the goodness is removed, rendering it a nutrient deficient indulgence. The negative effects of too much sugar are well known; it rots teeth, creates mood swings and cravings, causes diabetes, feeds cancer and leads to obesity. So why do we love it so much?

We crave sugar because the brain needs glucose to function. A chocolate bar or sweet snack can give us a quick boost of energy while on the go. These ‘treats’ are readily available, relatively cheap and

highly addictive. The brain reacts to sugar the same way it responds to cocaine; the reward centre in your cerebral cortex is stimulated but your body is unsatisfied so your brain cries out for more.

The first chemical sweetener, saccharin, was discovered by accident in 1884 but didn't become popular until sugar supplies dwindled in the First World War.

Aspartame, one of the most common sweeteners in the U.K., has 92 listed adverse effects. These health implications can be sudden and severe (blindness, seizures, brain damage, death) or slow and steady (personality changes, hearing impairment, depression, fibromyalgia, arthritis). It was known in the 1960s that aspartame causes neurological disorders and it has a tainted history of approval.

When it was introduced to American consumers in 1983 there was a 10% jump in brain tumours within six months; a 30% increase in diabetes and a 60% increase in brain lymphoma.

In 1984, pharmaceutical giant G.D. Searle manipulated aspartame research data to produce a favourable outcome. Some of the animals in the study developed tumours but instead of noting the results accurately, scientists removed the growths and the animals continued in the trial.

Other animals died but were falsely recorded as surviving the study. Participants in another experiment complained of feeling poisoned and the study had to be stopped. Aspartame is not recommended for those with mood disorders as it can aggravate psychiatric conditions and increase suicidal thoughts. One researcher said: 'I know it causes seizures.'

Aspartame is composed of aspartic acid, phenylalanine and methyl ester, which immediately converts to methanol, formaldehyde (which wreaks havoc with DNA) and formic acid. It breaks down into diketopiperazine (DKP), a known brain tumour agent. Phenylalanine can cause ADD/ADHD and irreversible brain damage, which is extremely concerning considering it is in so many drinks and sweets regularly given to children because their parents believe it is healthier than sugar.

Janet Hull, a leading expert on environmental toxicity, who cured herself from Graves' Disease by removing aspartame from her diet, says: 'If you go to the doctor and they cannot find the cause of your symptoms, it's probably caused by your diet, environment or both.'

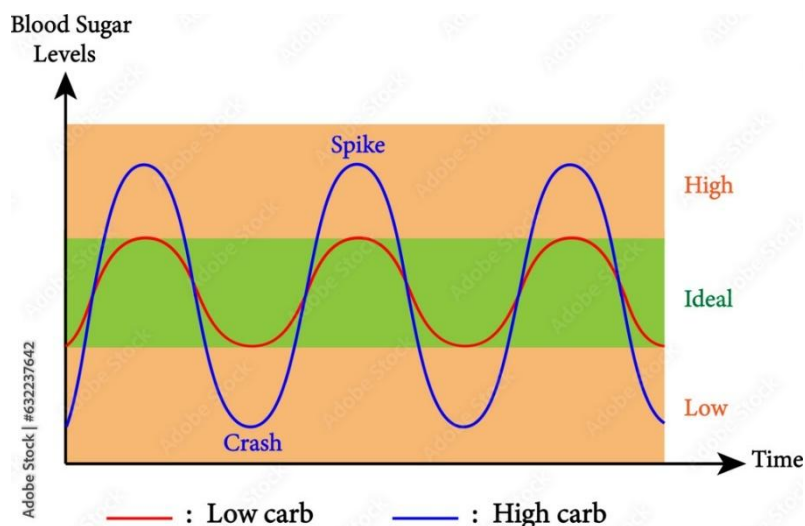
So what is the remedy if sugar is bad and artificial sweeteners are potentially worse? There are many natural alternatives on the market if you really can't eliminate sweet treats from your life. Coconut sugar is an excellent replacement in baking and hot drinks. Maple syrup, honey and agave nectar can be used when a drizzle or a glug is required. Stevia is good (but avoid the heavily processed stuff) and date sugar is about as natural as you can get. Failing that, try eating fruit more regularly to satisfy those cravings. Small changes work wonders to form long-lasting habits. You'll thank yourself later.

## **Activities**

1. We have already seen that there are good fats and bad fats. What do we mean by good carbs and bad carbs?
2. Summarise the article, focusing on the bad effects of aspartame.
3. In which drinks could we find aspartame? (see pictures on previous page)
4. In which foods could we find saccharine?
5. If buying processed foods, why should you avoid foods labelled as 'sugar-free'?

## How to avoid the glucose spikes.

Glucose spikes, when blood sugar rises and falls dramatically, causes energy crashes.



## Eat foods with a low Glycemic Index.

The Glycemic Index is a system that gives foods a score from 0 to 100, based on how quickly it raises blood sugar. A food with a low Glycemic Index would score under 50. A food with a high Glycemic Index would get a score of above 70.

High GI foods burn quickly and cause swings in the blood sugar levels. Low GI foods burn slowly and keep you going for longer.

### Examples of foods with LOW Glycemic Index scores (under 55)

meat, chicken, fish, eggs, olive oil, coconut oil, butter - 0

lettuce – 10, cheese - 10

tomato, capsicum, celery, spinach, cabbage - 15

nuts – average 15, plain yoghurt - 15

carrots, raw - 20, egg plant – 20,

milk - 27

dried beans/legumes/lentils - 30

apple, (raw) - 38

carrots, cooked – 39

coconut - 45

### **Examples of foods with MODERATE Glycemic Index scores (56 – 69)**

banana, basmati rice – 56

mango - 56

sweet potato (gold), cassava – 56

oats - 56

papaya - 60

dried fruits - 64

pineapple – 66

### **Examples of foods with HIGH Glycemic Index scores (70 or more)**

soft drink, fruit juice - 70

wholemeal bread – 71

rice, (white jasmine); watermelon – 72

pumpkin - 75

refined breakfast cereals – 75 or more

biscuits & bakery foods – 80 to 100

white potato – 70 to 95 depending on variety & cooking method

*Note that boiled potatoes & sweet potatoes have a lower Glycemic index than roasted.*

jelly beans (and similar sweets) – 80

white bread - 100

*Note that white bread is higher than sugar!*

For a more extensive list of foods and their Glycemic Index, refer to page 39.

### **The benefit of low GI foods**

They minimize blood sugar spikes. With less carbs, your body uses its own fat storage for energy.

#### **Activities**

1. What is the Glycemic Index and how can it help people who want to lower their blood sugar?
2. Make a table with 3 columns labelled 'high GI', moderate GI' and 'low GI'. List 5 foods in each category.

## The benefit of protein and fat

With less carbohydrates, protein and fat become the preferred energy sources for your body. Your body fat gets used up. Protein, and particularly fat, give satiety. That is the feeling of being full. They keep you going for longer and you won't get hungry so soon.

## Fat does not make you fat

....IF you eat fat with protein, and/or low GI carbs such as salad or low-carb vegetables

A meal of meat and salad, or low-carb vegetables, is satisfying. You can add olive oil and lemon dressing.

Meat does not have to be low-fat provided you are not eating it with high carbs like rice and potatoes. Fat eaten with starchy or sugary foods WILL make you fat.

## This is good news

High-fat foods combined with protein foods do not cause weight gain. Examples of good fats are butter, cream, cheese, coconut oil, fatty meat, oily fish and egg yolk.

Examples of foods that combine protein with low-carb vegetables / salad. Can you think of other meal combinations?



Meat, soft cheese, avocado,  
roasted sweet potato

Beef, tomatoes, orange veg,  
roasted seeds, feta cheese



Lentil stuffed and roasted capsicum

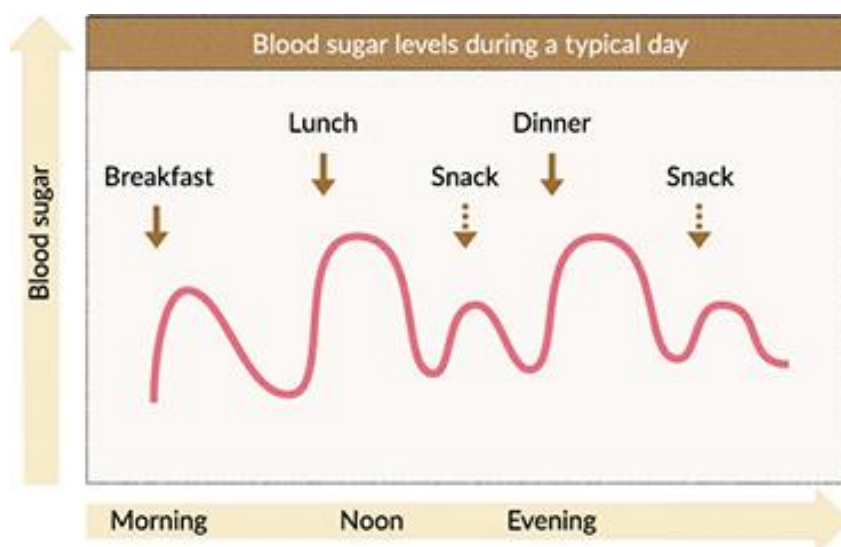


## Do we really need carbs?

If carbs are designed for energy, but we can also get energy from fat, do we really need them? Good carbs give us extra fuel for the brain. Good carbs, found in coloured vegetables, are rich in vitamins and minerals. If you ate ONLY protein and fat for a period of time you would lose weight, but this is not sustainable. Your body would eventually suffer from vitamin & mineral deficiencies.

## Snacking

We should allow each meal to digest fully before starting up the digestion process again. This takes about 4 – 5 hours. If you interrupt the digestion process with snacking, the insulin spikes will be rising and falling continually.



Notice that there are more spikes and crashes with snacking? This means there is greater potential to wear out the cells of the pancreas.

## Drinks

Drink plenty: on rising and between meals. Drinking with meals slows down the digestion process. How much water you need depends on body weight. The average is 2 litres. Apart from water, herbal teas are suitable, as well as black or green tea, or pure coconut water. Of course, no added sugar, sweet drinks or alcohol.

## Activities

1. Why do we need carbs (good carbs)?
2. What would happen if you ate no carbs at all?
3. Why is snacking not beneficial to health?
4. How long should you allow the digestive system to rest for between meals?

## The cost of a low-carb diet

While it is true that meat, chicken and fish are more expensive than rice, potatoes and pasta, deleting processed foods and making your own will save you money. See if you can grow your own low-carb vegetables, or do a deal with someone who grows them. Dahl, made from lentils, is inexpensive and still a low GI food. Lentils are half protein and half carb and still in the low GI range. Eggs are excellent. Chick peas are another good option.

## Activities

1. Design food plans for 3 days, (3 meals per day). Use the Glycemic Index chart on the next page to help you choose low GI foods. Include plenty of good protein and good fats.
2. Read the meal ideas on pages 41 and 42.
  - a) Choose 3 meals that you have not tried before and would like to try.
  - b) Create your own recipe idea for a meal that has foods of a low Glycemic Index.



## Glycemic Index Food Chart

| <b><i>Low GI foods: (under 55)</i></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b><i>Moderate GI foods: (56-69)</i></b>                                                                                                                                                                                                                                                                                                                                                                      | <b><i>High GI foods: (70 &amp; above)</i></b>                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Vegetables:</i></b><br>Avocado - 10<br>Lettuce – 10<br>Asparagus – 15<br>Broccoli – 15<br>Cucumber – 15<br>Tomato – 15<br>Capsicum – 15<br>Celery – 15<br>Spinach – 15<br>Cabbage - 15<br>Carrots, raw – 20; cooked – 40<br>Eggplant - 20<br>Green peas - 48<br><br><b><i>Protein</i></b><br>Meat/chicken/fish - 0<br>Eggs - 0<br>Cheese – 0 to 10<br>Nuts – average 15<br>Dried beans/legumes/lentils - 30<br>Sausages - 30<br>Milk – 27<br>Plain yoghurt – 35<br><br><b><i>Fats</i></b><br>Butter – 0<br>Olive oil – 0<br>Coconut oil - 0<br><br><b><i>Fruit</i></b><br>Berries - 15<br>Grapefruit – 23<br>Apple, (raw) - 38<br>Peach – 42<br>Orange - 44<br>Grapes – 45<br><br><b><i>Grains</i></b><br>Buckwheat – 50 | <b><i>Vegetables</i></b><br>Parsnip – 52<br>Sweet corn – 54<br>Sweet potato – 56<br>Cassava – 56<br>Taro - 56<br>Pumpkin – 65<br>Beetroot – 65<br><br><b><i>Fruit</i></b><br>Banana - 55<br>Mango – 56<br>Papaya - 60<br>Dried fruits – 64<br>Pineapple – 66<br><br><b><i>Grains</i></b><br>Brown rice - 55<br>Quinoa - 55<br>Basmati white rice – 58<br>Wheat pasta – 45 to 60<br>Rye bread (sourdough) - 65 | <b><i>Vegetables</i></b><br>Potatoes (white) – 70 to 95<br><br><b><i>Fruit</i></b><br>Watermelon - 72<br><br><b><i>Grains</i></b><br>Wholemeal wheat bread – 71<br>Rice, (white Jasmine) - 72<br>Commercial breakfast cereals - 75<br>Muesli – 80<br>Oats – 87<br>Bakery foods (wheat) – 80 to 100<br>Oats - 87<br>White bread - 100<br><br><b><i>Other</i></b><br>Honey - 73<br>Jelly beans (or similar sweets) – 80 |

## 16 Low-carb meal ideas

Choose whether you want to eat these meals for breakfast, lunch or dinner. (Note that dinner must not be eaten late.) For frying, use olive oil, coconut oil or butter. For weight loss, vary your menus daily.

### **Meal idea 1: eggs or omelette**

2 to 3 eggs – can be fried in olive oil or butter, or make an omelette, adding salt and pepper. Eat with salad or low-carb stir-fried vegetables such as tomato, capsicum, zucchini

Optional: add grated cheese

### **Meal idea 2: Yoghurt, nuts, seeds and fruit**

Greek plain yoghurt with nuts (e.g. almonds, walnuts). and seeds (e.g. sunflower, pumpkin, sesame, flaxseeds). Add low sugar fruit such as sour green apple, passionfruit, kiwi fruit, plum or berries

### **Meal idea 3: Fish with low-carb cooked vegetables or salad**

### **Meal idea 4: Meat/chicken with salad or cooked low-carb vegetables**

### **Meal idea 5: Dahl (red lentils) with stir-fried low-carb vegetables or salad**

### **Meal idea 6: Minced beef patties in tomato sauce**

Make the sauce from stir-fried onion and add 1 can tinned tomatoes. Add salt, pepper, herbs and spices.

### **Meal idea 7: One pan minced beef and vegetables**

Stir-fry onion, egg plant, capsicum, zucchini, cabbage. Set aside. Stir fry minced beef. Add the stir-fried vegetables and a can of tomatoes. Add salt and spices to your taste.

### **Meal idea 8: Zucchini Spaghetti Bolognaise**

Coarsely grate a zucchini. Place in a large pan and stir-fry in olive oil and a little salt. Set aside. Chop one onion. Stir fry onion in the pan with olive oil. Add beef mince and continue to stir fry. Add a can of tomatoes, salt and Italian herbs. Place lid on pan and cook for half an hour. When done, serve the meat and tomato dish on top of the grated zucchini prepared beforehand.

### **Meal idea 9: Vege-lentil burgers**

Drain a can of chick peas, or 1 cup cooked, drained brown lentils. Place them in a bowl and crush. In a pan, stir-fry onion, chopped zucchini, tomato, capsicum, or any other low-carb vegetables. Add them to the chick peas/lentils in the bowl. Add 2 eggs and mix. Place in spoonfuls into the hot pan, like making pancakes. Turn when ready.

### **Meal idea 10: Chia pudding**

Mix 1 tablespoon chia seeds, ½ cup coconut cream, 2 passionfruit or ½ cup crushed berries. Let sit overnight.

### **Meal idea 11: Lentil soup**

brown lentils, onions, garlic, diced carrot, zucchini, celery, cabbage, spices, salt,

### **Meal idea 12: Lettuce wraps**

2-3 large lettuce leaves. Fill with chopped cooked chicken, 2 tablespoons hummus, tomato, red onion and 1 tablespoon pumpkin seeds, grated cheese

### **Meal idea 13: Avocado and egg salad**

½ an avocado, chopped and sprinkled with salt, olive oil and lemon juice. Add chopped tomato, cucumber and celery.

### **Meal idea 14: Hummus with celery sticks**

Blend, crush or whizz in a food processor: 1 can chick peas, 3 tablespoons tahini, 1 tablespoon olive oil, 1 tablespoon lemon juice, 1 teaspoon salt, pepper to taste or sweet paprika. Use as a dip for vegetable sticks such as celery or raw carrot.

### **Meal idea 15: Salmon or sardines and veg**

Sardines and low-carb vegetables or salad – lettuce, cucumber, tomato, celery, avocado. Add olive oil and lemon dressing to the salad. (Salmon may be used instead of sardines, but avoid tinned tuna due to high mercury content.)

### **Meal idea 16: Chicken Tikka with cauliflower rice**

Chop cauliflower very fine and stir-fry in a pan. Remove and set aside. Cook about half kilo of chicken pieces in the pan. Sprinkle with Moroccan or Indian spices while cooking. Remove from the pan and set aside. In the pan now stir-fry sliced onion. Add a can of tomatoes, 1 teaspoon salt, more spices and cook for about 10 minutes. Add the chicken to the pan. Stir in 1 cup coconut cream. Serve the chicken dish on top of the cauliflower rice.

# Eating Disorders

Remember the difference between “going on a diet” and changing your lifestyle for health? People who “go on diets” often do this for the wrong reasons. They often fail and find themselves in a cycle of ‘yo-yo dieting’ with repeated failures. After each failure they try another diet, it’s only short-term. Constant failure leads to depression and anxiety, and can lead to eating disorders.

## Dieting for the wrong reasons

- I don’t like myself as I am.
- People won’t like me as I am.
- I won’t “fit in” if I am overweight.
- I want to look like a super model.
- I want to wear trendy clothes.

## Changing your lifestyle for the right reasons

- I know that God loves me as I am, but I want to live a long and healthy life so that I can serve Him, and fulfil the purpose he has for me.
- If I don’t change my lifestyle, I am a sitting time-bomb for diabetes and heart disease.
- My worth as an individual is not based on how I look, but having good health will give me a better life.

## Problems with short-term “dieting”

- obsession with eating or not eating
- feeling guilty when you eat the wrong foods
- punishing yourself for failure
- starving yourself with “low-calorie” foods hunger
- mood changes when you don’t have enough food for energy

## Why do so many attempts to “diet” fail?

Apart from dieting for the wrong reasons, many people try to diet with incorrect health advice, or wrong preconceived ideas such as ...

- “Restrict your food intake and you will automatically lose weight.” (Wrong!)
- “Don’t eat anything containing fat.” (Wrong!)

## **How is a low-carb lifestyle eating pattern different?**

- You can eat normal quantities of food.
- You are careful about choosing the right nutrients.
- You can eat fat and protein together, which will satisfy you and make you feel satisfied instead of hungry.

## **Advantages of eating to change your lifestyle**

- You learn which foods are optimal for your health.
- You don't have to "count calories" because you know the best foods to eat.
- Your goal is to lose weight gradually, and if you have occasional slips, you know how to get back on track.
- You will never feel starving or even hungry if you eat enough protein and fat.
- You will feel healthier because you are getting the right nutrients.

## **Diets that go too far can lead to health problems**

When the diet becomes so restrictive, you have an imbalance of nutrients, so less energy. As this process progresses, you start to lose weight, but you're actually starving your body. This can lead to a preoccupation with food and urges to overeat. There are also mood changes including irritability, increased anxiety, distorted body image, fear of failure and shame.

### **Anorexia**

If you have anorexia, you may have an intense fear of gaining weight or becoming "fat." You may have a false sense of body image or think your self-worth depends on your body size. As a result, you may try to correct this perceived "flaw" by strictly limiting your food intake and exercising too much to lose weight. But extreme weight loss can lead to dangerous health problems and even death. Anorexia is very dangerous because your body doesn't get the nutrients it needs to stay healthy. As a result, you may develop problems throughout your body, including conditions that affect your heart, muscles, digestion, skin and hair.

### **Bulimia**

This starts from submitting yourself to extreme hunger when dieting. This can lead to binge eating or a loss of control while eating. A person who binge eats consumes a large amount of food at one time and may not feel like they can stop even when they're full. To compensate for overeating, there are attempts to "get rid" of food consumed during a binge, include self-induced vomiting, over-exercising and laxative abuse. Driven by a desire to lose weight, a person may find themselves in a cycle of bingeing and purging.

Without treatment, bulimia can cause serious health problems like dehydration, tooth decay, ulcers and heart failure.

### **What are the symptoms and warning signs?**

- emotional eating
- repetitive or obsessive dieting and binge eating
- thinking and talking about food, weight and body appearance a lot of the time
- preoccupation with exercise or body building
- feeling guilt and or shame about eating patterns
- fearing gaining weight
- difficulty concentrating

### **Overcoming eating disorders**

- Self-acceptance – stop believing you’re not good enough. (Psalm 139)
- Try to remember that you don’t have to do things perfectly all the time. You have a long-term goal.
- Have a realistic perception of what your body looks like or should look like.
- Know that you are loved by God and others.
- Stay away from influences of the media and social pressures to look a certain way.
- When overwhelmed, ask for help.
- Instead of viewing food as a negative thing, make it into a positive experience by making a list of positive goals for improving your health.

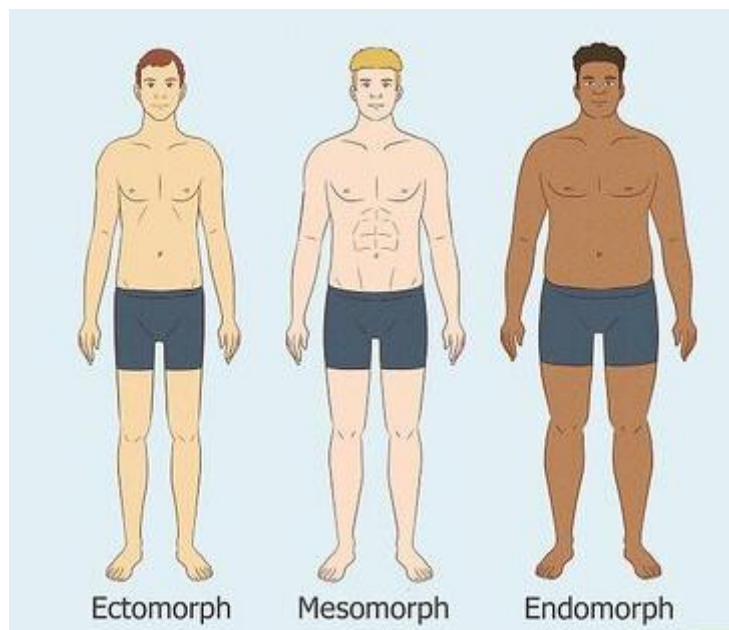
### **Activities**

1. What are some of the wrong reasons for people going on diets?
2. What would be the right reasons for wanting to change your eating habits to something healthier?
3. Why is a low-carb permanent eating pattern better than a one-off ‘diet’?
4. What’s the best way to avoid hunger and still be eating healthy food?
5. Name the two common eating disorders and give a description of each.
6. What are the warning signs of a person who might be on the verge of an eating disorder?
7. How could you help someone with an eating disorder? What could you say to them?
8. What does Jesus say about *worrying* about food? (Matt 6:25-27)
9. How could this verse apply to someone who is over-worrying about their self-image?

# Body Composition

## Everyone is different

There are 3 main body types: ectomorph, mesomorph, and endomorph. Ectomorphs, have slim bodies with little muscle or fat. Mesomorphs, have lean, muscular bodies and tend to build muscle easily. Endomorphs, have softer bodies and more body fat.



Focusing only on your ideal weight is not always helpful. Everyone has a different ideal weight, depending on height and frame size.

People with a larger frame will have larger bones and therefore will have a higher ideal weight.

## Fat and Muscle

A person may be of ideal weight for their height and frame size, but still not have a good body composition, because they are carrying too much fat in certain areas, (like around the belly), and are lacking in muscle.



## **Body composition can be changed.**

Through healthy eating and exercise, body fat can be converted to muscle.

### **Types of Exercise:**

**Cardio** – gets the heart pumping

- walking
- swimming
- dancing
- running
- sports

**Weight-bearing** – builds the bones and muscles

- gardening
- physical work
- swimming
- walking up and down stairs
- lifting weights

## **What is your correct height weight ratio?**

### **Body Mass Index (BMI)**

Your “body-mass index” is a number that takes into account your weight and height.

$$\text{BMI} = \text{weight (kg)} \div \text{height (m)}^2$$

Refer to the following height-weight chart for your ideas BMI:

## Weight in Kilograms

| Height in Centimeters |       | 45   | 48   | 50   | 53   | 55   | 58   | 60   | 63   | 65   | 68   | 70   | 73   | 75   | 78   | 80   | 82.5 | 85   | 87.5 | 90   |
|-----------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                       | 145.0 | 21.4 | 22.6 | 23.8 | 25.0 | 26.2 | 27.3 | 28.5 | 29.7 | 30.9 | 32.1 | 33.3 | 34.5 | 35.7 | 36.9 | 38.0 | 39.2 | 40.4 | 41.6 | 42.8 |
|                       | 147.5 | 20.7 | 21.8 | 23.0 | 24.1 | 25.3 | 26.4 | 27.6 | 28.7 | 29.9 | 31.0 | 32.2 | 33.3 | 34.5 | 35.6 | 36.8 | 37.9 | 39.1 | 40.2 | 41.4 |
|                       | 150.0 | 20.0 | 21.1 | 22.2 | 23.3 | 24.4 | 25.6 | 26.7 | 27.8 | 28.9 | 30.0 | 31.1 | 32.2 | 33.3 | 34.4 | 35.6 | 36.7 | 37.8 | 38.9 | 40.0 |
|                       | 152.5 | 19.3 | 20.4 | 21.5 | 22.6 | 23.6 | 24.7 | 25.8 | 26.9 | 27.9 | 29.0 | 30.1 | 31.2 | 32.2 | 33.3 | 34.4 | 35.5 | 36.5 | 37.6 | 38.7 |
|                       | 155.0 | 18.7 | 19.8 | 20.8 | 21.9 | 22.9 | 23.9 | 25.0 | 26.0 | 27.1 | 28.1 | 29.1 | 30.2 | 31.2 | 32.3 | 33.3 | 34.3 | 35.4 | 36.4 | 37.5 |
|                       | 157.5 | 18.1 | 19.1 | 20.2 | 21.2 | 22.2 | 23.2 | 24.2 | 25.2 | 26.2 | 27.2 | 28.2 | 29.2 | 30.2 | 31.2 | 32.2 | 33.3 | 34.3 | 35.3 | 36.3 |
|                       | 160.0 | 17.6 | 18.6 | 19.5 | 20.5 | 21.5 | 22.5 | 23.4 | 24.4 | 25.4 | 26.4 | 27.3 | 28.3 | 29.3 | 30.3 | 31.3 | 32.2 | 33.2 | 34.2 | 35.2 |
|                       | 162.5 | 17.0 | 18.0 | 18.9 | 19.9 | 20.8 | 21.8 | 22.7 | 23.7 | 24.6 | 25.6 | 26.5 | 27.5 | 28.4 | 29.3 | 30.3 | 31.2 | 32.2 | 33.1 | 34.1 |
|                       | 165.0 | 16.5 | 17.4 | 18.4 | 19.3 | 20.2 | 21.1 | 22.0 | 23.0 | 23.9 | 24.8 | 25.7 | 26.6 | 27.5 | 28.5 | 29.4 | 30.3 | 31.2 | 32.1 | 33.1 |
|                       | 167.5 | 16.0 | 16.9 | 17.8 | 18.7 | 19.6 | 20.5 | 21.4 | 22.3 | 23.2 | 24.1 | 24.9 | 25.8 | 26.7 | 27.6 | 28.5 | 29.4 | 30.3 | 31.2 | 32.1 |
|                       | 170.0 | 15.6 | 16.4 | 17.3 | 18.2 | 19.0 | 19.9 | 20.8 | 21.6 | 22.5 | 23.4 | 24.2 | 25.1 | 26.0 | 26.8 | 27.7 | 28.5 | 29.4 | 30.3 | 31.1 |
|                       | 172.5 | 15.1 | 16.0 | 16.8 | 17.6 | 18.5 | 19.3 | 20.2 | 21.0 | 21.8 | 22.7 | 23.5 | 24.4 | 25.2 | 26.0 | 26.9 | 27.7 | 28.6 | 29.4 | 30.2 |
|                       | 175.0 | 14.7 | 15.5 | 16.3 | 17.1 | 18.0 | 18.8 | 19.6 | 20.4 | 21.2 | 22.0 | 22.9 | 23.7 | 24.5 | 25.3 | 26.1 | 26.9 | 27.8 | 28.6 | 29.4 |
|                       | 177.5 | 14.3 | 15.1 | 15.9 | 16.7 | 17.5 | 18.3 | 19.0 | 19.8 | 20.6 | 21.4 | 22.2 | 23.0 | 23.8 | 24.6 | 25.4 | 26.2 | 27.0 | 27.8 | 28.6 |
|                       | 180.0 | 13.9 | 14.7 | 15.4 | 16.2 | 17.0 | 17.7 | 18.5 | 19.3 | 20.1 | 20.8 | 21.6 | 22.4 | 23.1 | 23.9 | 24.7 | 25.5 | 26.2 | 27.0 | 27.8 |
|                       | 182.5 | 13.5 | 14.3 | 15.0 | 15.8 | 16.5 | 17.3 | 18.0 | 18.8 | 19.5 | 20.3 | 21.0 | 21.8 | 22.5 | 23.3 | 24.0 | 24.8 | 25.5 | 26.3 | 27.0 |
|                       | 185.0 | 13.1 | 13.9 | 14.6 | 15.3 | 16.1 | 16.8 | 17.5 | 18.3 | 19.0 | 19.7 | 20.5 | 21.2 | 21.9 | 22.6 | 23.4 | 24.1 | 24.8 | 25.6 | 26.3 |
|                       | 187.5 | 12.8 | 13.5 | 14.2 | 14.9 | 15.6 | 16.4 | 17.1 | 17.8 | 18.5 | 19.2 | 19.9 | 20.6 | 21.3 | 22.0 | 22.8 | 23.5 | 24.2 | 24.9 | 25.6 |
|                       | 190.0 | 12.5 | 13.2 | 13.9 | 14.5 | 15.2 | 15.9 | 16.6 | 17.3 | 18.0 | 18.7 | 19.4 | 20.1 | 20.8 | 21.5 | 22.2 | 22.9 | 23.5 | 24.2 | 24.9 |

<http://www.freebmiccalculator.net>

Underweight
  Nomal
  Overweight
  Obesity

However, BMI may not always be the best way to calculate your ideal weight, because it does not take into consideration your frame size.

### Frame size

Frame size can be small, medium or large.

People with a large frame have bigger bones and therefore it will be normal for them to weigh more than someone of the same height, but with smaller bones. So, frame size must be taken into consideration.

You can measure your frame size by measuring your wrist circumference.

## Measuring frame size using wrist measurement

### How to measure

Wrap the measuring tape around the circumference of your wrist, just above the knobby bone, until it overlaps.

|                   | <b>Small</b> | <b>Medium</b>     | <b>Large</b> |
|-------------------|--------------|-------------------|--------------|
| <b>Men</b>        | < 15.25 cm   | 15.25 cm – 17.15  | > 17.15      |
| <b>Women</b>      | < 14 cm      | 14 cm to 15.25 cm | > 15.25      |
| <b>Teen Boys</b>  | < 14.7       | 14.7 to 16.5 cm   | > 16.5       |
| <b>Teen Girls</b> | < 13.46      | 13.46 to 14.7     | > 14.7       |

The table of the next page shows your ideal weight according to both height and frame size.

### Activities

1. List and describe the three basic body types.
2. What is BMI?
3. What is your BMI?
4. Check your BMI on the chart – underweight, normal, overweight, obese. (This is personal information and does not have to be shared.)
3. What else should be taken into account?
4. How is frame size measured?
5. What is your frame size?
6. Using the chart below which takes frame size into account, what is your ideal weight for your height? (Again, this is personal information and does not have to be shared.)
7. Using the table on page 51, what is your ideal waist size for your age?

# Height-Weight ratios according to Frame Size

## Women

| Height (cm) | Small Frame (kg) | Medium Frame (kg) | Large Frame (kg) |
|-------------|------------------|-------------------|------------------|
| 147.5       | 46 - 50          | 49.5 - 55         | 53.5 - 60        |
| 149.5       | 46.5 - 51        | 50.5 - 56         | 54.5 - 61        |
| 152.5       | 47 - 52          | 51 - 57           | 55.5 - 62        |
| 155         | 48 - 53.5        | 52 - 58.5         | 57 - 63.5        |
| 157.5       | 49 - 55          | 53.5 - 60         | 58 - 65          |
| 160         | 50 - 56          | 55 - 61           | 59.5 - 66.5      |
| 162.5       | 52 - 57.5        | 56 - 62.5         | 61 - 68.5        |
| 165         | 53 - 59          | 57.5 - 64         | 62 - 70          |
| 167.5       | 54.5 - 60        | 59 - 65.5         | 63.5 - 72        |
| 170         | 56 - 61.5        | 60.5 - 65.5       | 65 - 74          |
| 173         | 57 - 63          | 61.5 - 68.5       | 66 - 76          |
| 175         | 58.5 - 64.5      | 63.5 - 69.5       | 67.5 - 77        |
| 178         | 60 - 66          | 64.5 - 71         | 69 - 78.5        |
| 180.5       | 61 - 67          | 65.5 - 72         | 70.5 - 80        |
| 183         | 62.5 - 68.5      | 67 - 73.5         | 71.5 - 81        |

## Men

| Height (cm) | Small Frame (kg) | Medium Frame (kg) | Large Frame (kg) |
|-------------|------------------|-------------------|------------------|
| 157.5       | 58 - 61          | 60 - 64           | 62.5 - 68        |
| 160         | 59 - 62.5        | 60.5 - 65         | 63.5 - 69.5      |
| 162.5       | 60 - 62.5        | 61 - 66           | 64.5 - 71        |
| 165         | 61 - 63.5        | 62 - 67           | 65.5 - 72.5      |
| 167.5       | 61.5 - 64.5      | 63 - 68           | 66 - 74.5        |
| 170         | 62.5 - 66        | 64.5 - 70         | 67.5 - 76        |
| 173         | 63.5 - 67        | 66 - 71           | 69 - 78          |
| 175         | 64.5 - 68.5      | 67 - 72.5         | 70.5 - 80        |
| 178         | 65.5 - 70        | 68.5 - 74         | 71.5 - 81.5      |
| 180.5       | 66 - 71          | 70 - 75           | 73 - 83.5        |
| 183         | 67.5 - 72.5      | 71 - 77           | 74 - 85          |
| 185.5       | 69 - 74.5        | 72.5 - 79         | 76 - 87          |
| 188         | 70 - 76          | 74 - 81           | 78 - 89.5        |
| 190         | 71.5 - 78        | 76 - 82.5         | 80 - 91.5        |
| 193.5       | 73.4 - 80        | 77.5 - 85         | 82 - 94          |

## Waist circumference

This is another way to assess your body composition.

Ideal waist size refers to waist circumference a measurement that promotes optimal health and reduces health risk. The simple rule is to keep your waist circumference less than half your height:

**Ideal waist size = height x 0.5**

So, if you are 165 cm tall, your ideal waist circumference is 82.5 cm or less.

However, remember that this is “ideal” and does not differentiate between men and women, or differing frame sizes. It also does not take age into account. As you get older, your ideal waist measurement will increase.

The real value in keep track of your waist circumference is that you can easily see if you are losing weight around the middle, which is very important for avoiding or reversing Type 2 Diabetes.

The following table shows average waist size according to age, (but does not take into account frame size, so you need to add or subtract about 2 cm for small/large frame.)

### Average waist size by age

| Age   | Men      | Women   |
|-------|----------|---------|
| 20-29 | 89.2 cm  | 82.4 cm |
| 30-39 | 94.0 cm  | 87.0 cm |
| 40-49 | 97.1 cm  | 90.9 cm |
| 50-59 | 101.6 cm | 93.9 cm |
| 60-69 | 104.5 cm | 97.2 cm |
| 70+   | 101.5 cm | 94.4 cm |

## Words of encouragement for people wanting to improve their health

“Every step is progress, no matter how small.”

“Consistency is the key.”

“Results will come; be patient.”

“Stay committed to your goals.”

“Every healthy meal is a step towards your goal.”

(Hebrews 10:36)

