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By Harry Jivenmukta

VALUE OF FOOD - OVERVIEW

1

The value of a food can be measured by its content of:

CARBOHYDRATES,

FATS,

FIBRE,

PROTEIN.

It may also be possible to measure its vitamin and mineral content, although most food labels do not include these. It is important to know these values because of the need to maintain a balanced intake. In the past it was easier to know what food we were eating because most food was prepared in the home and ingredients were known. But today, with the popularity of ready meals and fast food, there is often hidden fat and/or sugar which are difficult to assess.

All sorts of people need to know the values included in their food. These include:

HEALTH CONSCIOUS PEOPLE,

DIETERS,

DIABETICS,

PEOPLE WHO ARE SENSITIVE TO CERTAIN FOODS.

The example below informs us about the various values included in a 25 gram packet of crisps:

TYPICAL COMPOSITION	EACH BAG (25g) PROVIDES	100g PROVIDES
Protein	1.6g	6.3g
Carbohydrate	12.1g	48.3g
of which Sugars	1.0g	3.9g
Fat	8.7g	34.9g
of which saturates	3.8g	15.0g
Fibre	1.3g	5.1g

If you look at a food packet which has a breakdown of its contents, you may find two values; one of the proportion of the weight of the product, and one as a proportion of a 100 gram portion. The 100 gram comparison is often more useful because it allows you to compare values with other foodstuffs.

CARBOHYDRATES

2

Carbohydrates are compounds which are found in all living cells. They are made up of three chemicals; carbon, hydrogen and oxygen. The most common carbohydrate is **sugar**. Other sugars are also good sources of carbohydrate. These include **glucose** and **fructose**. Everyone needs carbohydrates because they give us energy.

There are different qualities of carbohydrate. The sugar carbohydrates give us a quick but short lived burst of energy whilst others, (e.g. in bread and potatoes), give us a slower release of energy but these last longer. Dieticians recommend these types of carbohydrates over the sugar ones because sugar energy is short lived but also because too much sugar has other negative implications like tooth decay.

The nutritional value of a food can be measured by the carbohydrate value. This is measured usually as a proportion of a 100 gram portion. The carbohydrate information on a packet of crisps might look like this:

TYPICAL COMPOSITION	EACH BAG (25g) PROVIDES	100g PROVIDES
Carbohydrate	12.1g	48.3g
of which Sugars	1.0g	3.9g

Some other carbohydrate values as a proportion of a 100 gram portion are:

WHITE BREAD	49 grams
MILK, (FRESH, WHOLE)	4 grams
NEW POTATOES (BOILED)	17 grams
PEAS (FROZEN PEAS, BOILED)	9 grams
ORANGE (WHOLE FRUIT)	8 grams
WHITE SUGAR	100 grams
TUNA	0 grams

FATS

Fat is any substance of plant or animal origin that is nonvolatile, insoluble in water, and oily or greasy to the touch. Fats are usually solid at ordinary temperatures, but they begin to melt at higher temperatures. Melted fat is usually called oil.

Together with oils, fats comprise one of the three principal classes of foodstuffs, the others being proteins and carbohydrates. Fat is sometimes called nature's storehouse of energy because on a weight basis it contains more than twice as much energy as does carbohydrate or protein. Fat is a useful store of energy and also keeps us warm. Some animals rely on their fat reserves to keep them alive in the winter months.

When a person overeats, their spare carbohydrates and proteins are turned into fat. Dieticians are increasingly concerned that people eat too much fat, and doctors say that people who are fat have a greater chance of heart attack because the fat blocks the arteries which carry blood around the body. Fat is essential for a healthy body, but the problem is working out what the correct balance of fat intake should be. In modern times it is becoming more difficult to get the balance right because 'fast food' and ready meals often are high fat or have hidden fat which is difficult to measure. The fat information on a packet of crisps might look like this:

TYPICAL COMPOSITION	EACH BAG (25g) PROVIDES	100g PROVIDES
Fat	8.7g	34.9g
of which Saturates	3.8g	15.0g

Some other Fat values as a proportion of a 100 gram portion are:

WHITE BREAD	1.9 grams
MILK, (FRESH, WHOLE)	3.9 grams
NEW POTATOES (BOILED)	0.3 grams
CHEESE (CHEDDAR)	34.4 grams
BUTTER (SALTED)	81.7 grams
STEAK (GRILLED)	10.1 grams
TUNA	9.0 grams

FIBRE

4

Fibre is not a nutrient. Dietary fibre is the natural packing of plant foods. It can be defined as those parts of foods that are not digested by the human body. Fibre is often used by people who want to lose weight because the food makes them feel full but it has little nutritional value. High-fibre diets promote the consumption of vegetables, fruits, nuts, and whole grains. Fibre also provides a bulk which helps the body to pass waste through the body. By increasing the bulk of material passing through the body, fibre helps the potentially cancer causing substances to pass quickly through the colon and bowel. Many breakfast cereals have high fibre content among other qualities. The fibre information on a packet of crisps might look like this:

TYPICAL COMPOSITION	EACH BAG (25g) PROVIDES	100g PROVIDES
Fibre	1.3g	5.1g

EXERCISE

What sort of people would have a high fibre diet? Why?

Why is fibre important in everyone's diet?

Make a list of five foods which are high fibre foods. How do people use these foods in their everyday diet?

MINERALS

5

Boron	Manganese
Calcium	Molybdenum
Chlorine	Nitrogen
Chromium	Phosphorus
Cobalt	Potassium
Copper	Selenium
Fluorine	Silicon
Iodine	Sodium
Iron	Sulphur
Magnesium	Vanadium
	Zinc

Minerals are essential for humans and they appear usually in very small quantities in most foodstuffs. People usually get enough of the essential minerals in their ordinary daily diet, but supplements are available for people who require them. These are usually part of a larger vitamin supplement.

Minerals are important in a number of body processes. **Iron** is used in the blood to make haemoglobin; iron-deficiency **anaemia** is more common in women than in men. **Calcium** is crucial to the growth of bones and teeth; its deficiency can cause bone softening in adults. Loss of **potassium** through diarrhoea may result in loss of tissue activity and muscle paralysis. Excessive **sodium** levels may result in high blood pressure, and sodium deficiency may cause low blood pressure and epileptic seizures. **Iodine** is used to synthesize thyroid hormones. Traces of other minerals are also found in the human body, but the functions that they serve are not all known.

EXERCISE

Find out which foods are rich in minerals. Find two foods which are high in Iron. Find two which are rich in Calcium.

Why are minerals important? Do we need to take mineral supplements or do we get enough minerals in our everyday diet?

Why do some people feel the need to take mineral supplements?

PROTEIN

Proteins are complex substances that are present in all living organisms. They are of great nutritional value and are directly involved in the chemical processes essential for life. The word protein comes from the Greek '**proteios**', meaning 'holding first place'. Proteins are species-specific; that is, the proteins of one species differ from those of another species. They are also organ-specific; within a single person, muscle proteins differ from those of the brain and liver.

Protein rich foods are essential for building up and maintaining the body cells. Protein is found in both meat and vegetables although many people associate protein only with meat. Proteins are often divided into two types; **Structural** and **Functional** proteins. Structural proteins help the body to maintain itself and among other things help the growth of nails and hair. Functional proteins are concerned with the actual functioning of the body and make sure that the essential activities of the body are maintained.

The need for proteins is very important for humans. The protein information on a packet of crisps might look like this:

TYPICAL COMPOSITION	EACH BAG (25g) PROVIDES	100g PROVIDES
Protein	1.6g	6.3g

Some other Protein values as a proportion of a 100 gram portion are:

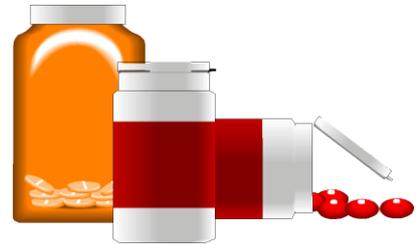
WHITE BREAD	8.4 grams
MILK, (FRESH, WHOLE)	3.2 grams
NEW POTATOES (BOILED)	1.5 grams
CHEESE (CHEDDAR)	25.5 grams
BUTTER (SALTED)	0.5 grams
STEAK (GRILLED)	27.3 grams
TUNA	27.1 grams

VITAMINS

7

A typical Vitamin supplement capsule will contain:

**VITAMIN A SEVERAL
VITAMIN Bs VITAMIN
C
VITAMIN D
VITAMIN E**



Vitamins can be divided into two categories: **Water-soluble** vitamins (the B vitamins and vitamin C) and **Fat-soluble** vitamins (A, D, E, and K).

Water-soluble vitamins are absorbed by the intestine and carried to the specific tissues in which they will be put to use. They are distinguished from each other by the degree to which they are soluble in water, a factor that influences their route inside the body. When intake of water-soluble vitamins exceeds a person's need for them, most of the excess is excreted in urine.

The body can store larger amounts of fat-soluble vitamins than of water-soluble ones. The liver provides the chief storage tissue for vitamins A and D, while vitamin E is stored mainly in body fat. Relatively little vitamin K is stored.

The fat-soluble vitamins perform different functions. Vitamin A combines with proteins in the retina of the eye to aid vision. Vitamin D is essential to the growth, especially in calcium metabolism for bone growth. Vitamin E also helps growth: deficiencies in the substance cause infertility. Vitamin K is necessary in processes in blood clotting.

EXERCISE

Why are vitamins important?

Find out more about how vitamins help the body. Which vitamins are the most important?

Which foods contain vitamins in large amounts? Find two foods which are rich in vitamin C. Find two which are good sources of vitamin D.

RECOMMENDED DAILY AMOUNTS



Recommended Daily Amounts or **RDAs** refers to the amount of vitamins or minerals which a person should consume each day. The calculation is made on the basis of the 'average' person. Most people get enough vitamins and minerals required for good health in their normal everyday diet. Some people who have had poor health or special nutritional needs do sometimes need to be aware of the vitamin and mineral content of their food. Some foods have RDA values included in their product packaging. The information on a typical packet of cornflakes might include:

VITAMIN	%RDA
VITAMIN D	25
THIAMIN (B1)	30
RIBOFLAVIN (B2)	40
NIACIN	25
VITAMIN B6	30
FOLIC ACID	55
VITAMIN B12	75
IRON	17

The values above are based on an average serving of cornflakes of 30 grams, with 125 ml of semi-skimmed milk.

EXERCISE

What do you think that '**average**' means in the sense of calculating RDAs?

Are you about average ?

If you are less than the average or more, how would you calculate your RDA?

Most people get enough vitamins and minerals in their normal diet. When might it be important to know what your intake of vitamins and minerals are?

Find two food packets which refer to RDAs. Compare and contrast their relative vitamin and mineral values.

CHOOSING A DIET

9

The type of diet which a person chooses depends on several factors including;

Health reasons,

Type of lifestyle,

Affordability,

Availability.

People who play active sports often prefer a high energy, **high carbohydrate diet**. Whilst a sprinter may need a quick burst of energy and so prefers glucose and high sugar drinks and food, a long distance runner would prefer longer lasting carbohydrate sources like rice and pasta which release energy over a longer period.

Dieters often choose a **high fibre diet** because fibre does not have any real nutrient content but fills the stomach.

Some people who are overweight or have health problems associated with excess fat will choose a **low fat diet**. For these people it is essential to avoid any food which is high in fat although it is important to remember that some fat is essential for the proper maintenance of the body.

Other people who may be diabetic or have related problems select a **low sugar diet**. They will choose foods which have low sugar or use sugar substitutes in the food they eat.

Some people, like weightlifters, eat a **high protein diet**. They concentrate on eggs, meat and fish. These foods also are high in fat, but this is usually worked off in training sessions.

EXERCISE

Design a diet for the following types of people. Find out about the relevant foods for each type and refer to the previous pages for guidance on food values:

A long distance runner,

An overweight man,

A dieting woman who wants to maintain her new low weight,

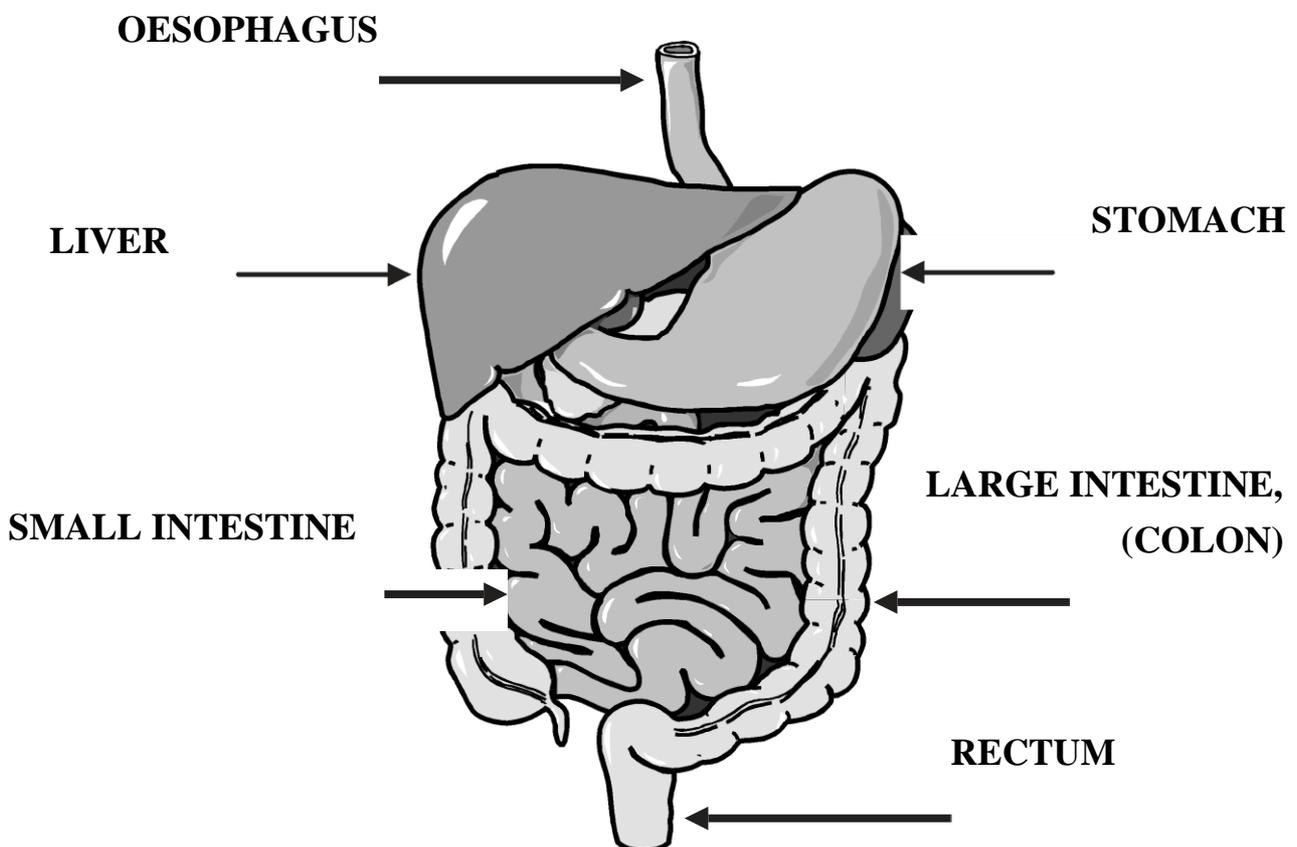
A sprinter.

HOW THE BODY DIGESTS

Human digestion begins in the **mouth**. There the food is chewed and mixed with saliva, which adds moisture and contains the enzyme amylase that begins to break down starches. The **tongue** kneads the food into a smooth ball (bolus), which is then swallowed and travels down the **oesophagus**. In the **stomach** the food is mixed with highly acidic gastric juices secreted into the stomach.

The food, now in a semiliquid state passes from the stomach into the **duodenum**, the first section of the **small intestine**, where the greatest part of digestion takes place. It is subjected to the actions of a large number of enzymes, some secreted by the pancreas. Each enzyme acts on specific food molecules. By the time this process has been completed, the carbohydrates have been broken down into simple sugars (monosaccharides), the proteins into amino acids, and the fats into glycerol and fatty acids. These simple molecules are then absorbed into the circulatory system through countless microscopic projections of the intestinal wall .

Substances that cannot be digested, such as cellulose (plant fibre), pass into the **colon**, or **large intestine**. There, water and ions such as sodium and chloride are reabsorbed, and the remaining solid material is held until it is expelled through the **anus**.



METABOLISM AND ENERGY

11

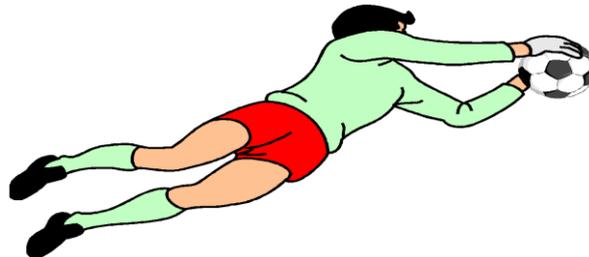
A dictionary definition of Metabolism is:

METABOLISM: *the chemical changes in living cells by which energy is provided for vital processes and activities and new material is assimilated; the sum of the processes by which a particular substance is handled in the living body.*



The process of metabolism is the way in which the body turns the food we eat into energy needed for the body to continue to function. The rate at which energy is expended for maintenance at rest, known as the basal metabolic rate (BMR), amounts to about 1.25 kilocalories per minute for a man weighing 65 kilograms (one kilogram = 2.2 pounds) and 0.90 kilocalories per minute for a woman weighing 55 kilograms. The basal metabolism, appears higher in men than in women. This is because women have relatively more fat and less muscle than men and because men tend to be more active.

The metabolic rate is raised by as much as 30 percent after a meal. This is due in part to the work of the digestive juices and in part to chemical processes, mainly in the liver, involved in the metabolism of absorbed products of digestion.



EXERCISE

What does metabolism mean?

Why do we need energy?

Make a list of the 5 activities which you do which uses most energy.

How can we conserve our energy?

What do you think is the relation between the use of energy in our bodies and being over weight?

CHOICE - PERSONAL

12

There are different ways of choosing. We all choose for different reasons. With regard to food the influences to our choice include:

What we want to eat,

What we may need to eat for medical reasons,

What others want us to eat, (parents, advisors),

What others want us to eat, (food producers, advertisements).

This exercise asks you to choose what you want to eat purely at a personal level. Ignore what everyone is telling you and write a diet for one week based on whatever you want.

	BREAKFAST	LUNCH	TEA	SUPPER
MON	_____			
TUE	_____			
WED	_____			
THUR	_____			
FRI	_____			
SAT	_____			
SUN	_____			

EXERCISE

What are the differences between your personal choice diet and the food you presently eat?

Is your personal choice healthier?

CHOICE - ADVICE FROM OTHERS

13

Other people often have a big say in what you eat. These can include:

- Parents and family members,**
- School, (school dinners),**
- Health advisers, doctors, etc.,**
- Television advertisements and fashion trends.**

Show your personal diet preferences to someone else and ask them for their advice. Write down the changes they would make to your meals on the chart below.

	BREAKFAST	LUNCH	TEA	SUPPER
MON	_____			
TUE	_____			
WED	_____			
THUR	_____			
FRI	_____			
SAT	_____			
SUN	_____			

EXERCISE

Do you think that other people help you to choose a better diet or not?

Is the diet advice better than the diet you chose for yourself?

Which other people are qualified to comment on someone else's diet?

CHOICE - AVAILABILITY

14

Sometimes your diet is determined by the availability of certain foodstuffs. This exercise takes that availability to extremes. Draw up a weekly diet based on **one** of the following restrictions:

No meat, fish or eggs are available for the whole week,

All fast food outlets are closed for a whole week, (fish and chips, pizzas, burgers, fried chicken, ice cream, Indian and kebab takeaways etc.),

Only fast food outlets are open and no ordinary food shops.

	BREAKFAST	LUNCH	TEA	SUPPER
MON	_____			
TUE	_____			
WED	_____			
THUR	_____			
FRI	_____			
SAT	_____			
SUN	_____			

EXERCISE

How would your diet vary in these circumstances?

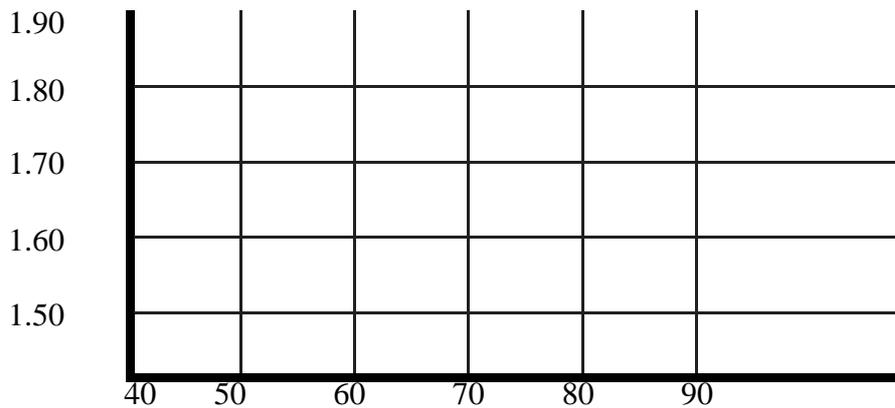
Is it important to have access to all types of food outlets? Which ones could you do without?

WEIGHT AND HEIGHT

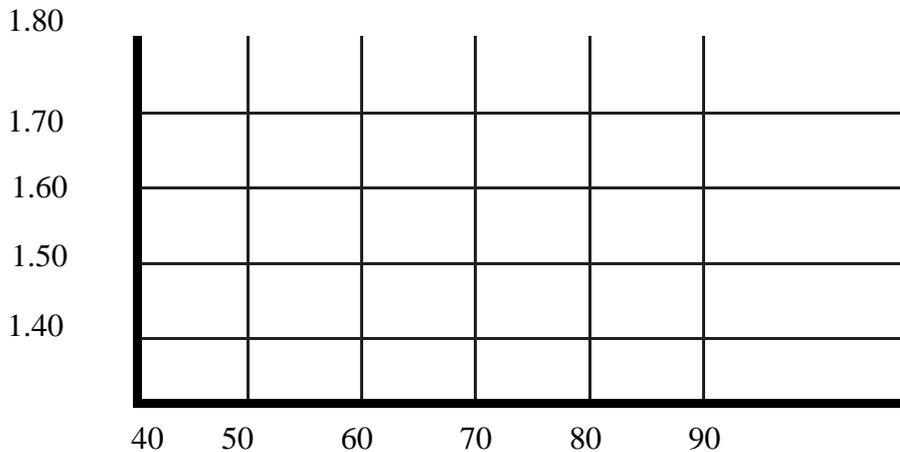
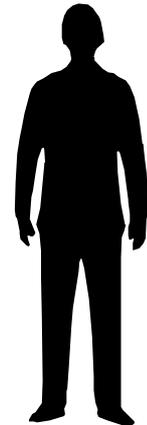
The ideal weight of a person is calculated by working out a weight by height ratio. This means that a shorter person should weigh less than a taller person. Charts usually have four values of weight;

- Underweight,**
- OK,**
- Fat,**
- Obese (very fat).**

Find a weight by height ratio chart and fill in the four categories outlined above. Use the first graph to put in the values for men and the second for women. An example of this is: A man who is 1.60 Metres tall is underweight if he weighs less than 50 Kilograms, OK if he weighs between 50 and 60 Kilograms, Fat if he weighs between 60 and 70 Kilograms, and Obese if he weighs more than 70 Kilograms.



Weight in Kilograms



Weight in Kilograms



Age does not only refer to older people but starts with a new born baby. When considering the important stages in human development and how this is affected by diet we could include;

Babies before they start eating solid food,

Toddlers,

Children until they stop growing,

Adults,

Older people who are not as active as normal.

Age becomes relevant in diet terms if it means that there is likely to be a change in what people of that age should eat. The change from the baby who does not eat solids, to the toddler who does is an obvious example. The change in older people who may not be too active is more difficult to calculate.

Health advisers who are asked to guide people in their diets often look at **lifestyle** when they give advice. This is true not only of the busy executive who may be rushing around all day, but also of the average teenager. Increasingly children are being given dietary advice because some children are getting little or no exercise at all. Often this is due to an increase in leisure pursuits like computer games which does not involve much physical activity. Taken together with a high fat high sugar diet this means that many young people are overweight and physically unfit.

EXERCISE

You have been asked to advise on the following situations. What sort of diet and exercise would you advise for the following:

The nearest I come to playing sport is playing Soccer '97 on my computer. I love burgers and fries, and fried chicken. I eat lots of chocolate and sweets. Soon I'm buying a new computer with the latest technology, and at least two new games. My mum drives me to school every day.

Last year I retired. I do tend to eat too much food. My doctor says that now I'm not as active as before I should be more careful with my diet, but I love eating. My favourite food is double chocolate gateaux. I've been thinking of taking up a hobby but I'm not sure what to do yet.

I'm out of the house by 7 am in the morning and don't usually get back until at least 8 pm. My day is full of driving to meetings and making bug buck decisions. My first meal is at about 1 pm. Until then its just gallons of coffee. When I do eat it's whatever's going. I do try to eat a proper meal in the evening. I think that I might possibly be drinking too much alcohol as well, but I suppose it goes with the job. My life is very fast and very competitive. I don't have time to think about balanced meals or healthy diets.

Health and diet are very closely related. Many people say '**you are what you eat**'. Sometimes people develop health conditions which means that they have to be more careful with regard to the food they eat. Some of the common health conditions which need close control are:

Anorexia Nervosa,

Diabetes, Obesity.

Anorexia Nervosa is a condition which develops due to excessive weight control through dieting. The majority of people who are anorexic are girls and young women. Their desire to lose weight becomes obsessive until they reach a point where they eat very little or nothing at all. They can die of malnutrition if they are not treated. A condition related to Anorexia is Bulimia. This is when people are driven to eat large amounts of food and then vomit until the stomach is empty.

Diabetics have to control their sugar intake. Their body stops or reduces its manufacture of insulin which controls blood sugar. In normal bodies the amount of insulin reduces or increases as required to control the amount of sugars in the body. Diabetics have to keep a close watch on their sugar intake and then take tablets or insulin injections to ensure that their blood sugar levels remain within a safe range.

Obesity is caused by overeating. Some people have low metabolic rates, (the speed at which the body burns energy), and so they get fat quite easily. Other people simply eat too much. Obesity can only be controlled by eating less food and if possible increasing the amount of exercise. In the UK nearly half the population is considered to be fat, and over a quarter are obese. Fat is calculated by whether a person weighs more than the maximum recommended weight calculated by the height of a person. Obesity is defined as being a person who weighs 30% or more over that recommended weight.

EXERCISE

Find out more about Anorexia, Diabetes and Obesity. Write a proposal on how people with these conditions can be helped through diet.

Make a list of foods which a diabetic person should avoid or consume only in small quantities.

What is the difference between fat and obese?

MULTICULTURALISM

The UK is a Multicultural country. This means that there are people from many different cultures living in the UK. You can see how many different cuisines there are by listing the different types of restaurants there are in your town. You can also look at the food in your own home and see which countries the food originated from. People commonly eat Indian, Chinese, Italian and American food as well as many others.

EXERCISE

How many people in your class regularly eat food which is not typical British food?

Make a list of the different types of restaurants in your area.

Make a list of the '**country of origin**' of the food in your home. Fill in the chart below with the names of the foods which come from other countries. Put the name of the country at the top of each column.

A consumer is anyone who buys or acquires products. Normally consumer rights refer to the rights of a person to return goods or complain about something they have bought in a shop. The rights of all consumers are the same and are stated in various Acts of Parliament. The important ones of these to remember are:

1955 Foods And Drugs Act,
1963 Weights And Measures Act,
1973 Fair Trading Act,
1974 Prices Act,
1974 Consumer Credit Act,
1976 Foods And Drugs Act,
1978 Consumer Safety Act,
1979 Sale Of Goods Act,
1979 Weights And Measures Act,
1990 Food Act.

The legal framework in the UK is divided into two sections; **Criminal** and **Civil** Law. These are important to understand because consumer rights fall in both these categories. An example of a criminal offence could be if someone sold goods which could be harmful to the buyer. This might be a faulty electrical item or contaminated food. A civil case involves the contract between two or more parties. In consumer rights this is usually the contract between the shopkeeper and the customer. Often people think that a contract is something which has to be written. In fact a contract can simply be a spoken agreement between two people.

If a consumer wants to complain about a particular product he or she must first be clear of the facts; what was bought, when it was bought, what the fault or complaint is, what action is required to correct the situation, and what will be done if the correction is not made.

Consumers sometimes have to appoint legal representatives if they want to proceed to the courts. Before this stage, however, the consumer can get free advice and guidance from the Citizens Advice Bureaux. The consumer has to make an appointment first but can obtain free legal advice from qualified solicitors before deciding how to proceed with a complaint.

EXERCISE

There are many ways in which to make a complaint. Imagine that you have bought a faulty electrical appliance.

Write a letter of complaint to the shop.

How would you deal with a face to face meeting with the manager of the shop?

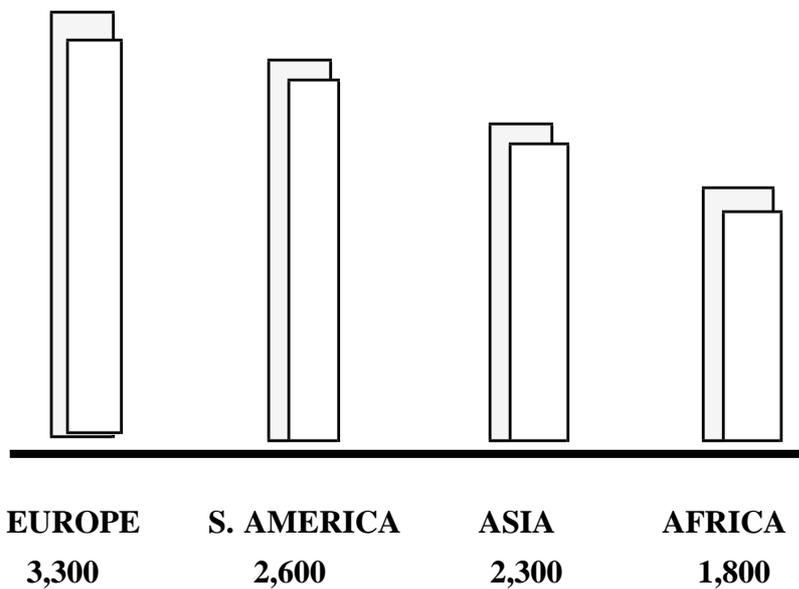
Plan what you would say in a telephone call to the shop.

Make a plan of action assuming that the shop is not prepared to even talk to you about your complaint.

WORLD CALORIES

20

The table below shows the amount of calories eaten each day on average in different parts of the world. Each figure is an average which means that some people will consume more and others less than the amounts stated.



EXERCISE

In Europe almost 50% of adults are considered to be overweight. What are the implications of this on the health of Europeans?

How might the health of people in Africa and Asia differ from people living in Europe? What are the advantages and disadvantages of a low calorie diet?

Find out how many calories dieters eat each day.

What do you think a healthy amount of calories are to eat each day?