Mom's Little Guide to Nutrition for
EVERYONE,
But especially for
School Children and Students.

Healthy Brains

Presented by:

STAYWELL

Live WELL to STAY Well!

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This booklet is distributed in conjunction with Staywell™ BrainHealth by Inter-Med.

For best results with BrainHealth, use on a continuous basis or begin taking at least one month prior to exams and throughout the exam period.

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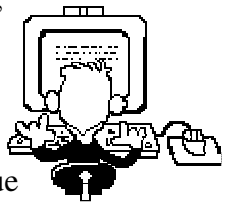
FOREWORD

As mothers, we only want the best for our children. Today, both mothers and children are under immense pressure to achieve high standards academically and on the sporting fields. There is a lot of information, many products and expert coaching available to assist our future sporting heroes. There is rather less available to help mothers help their children achieve academic success as well!

This booklet is NOT designed to be a comprehensive reference, nor is it intended to replace professional medical advice. Nevertheless the information presented in this booklet is based on the latest international research findings.

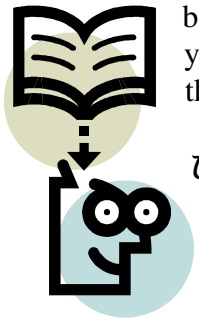
Mom's Little Guide to Nutrition for School Children and Students: Brain Health is designed as an easy-to-understand guide on how nutrition affects your child's brain. As the brain controls every part of the body, including our intellect, sporting ability, co-ordination, emotions and behaviour, nutrition of the brain therefore obviously also has a measurable effect on your child's intelligence, sporting ability, co-ordination, emotions and behaviour.

In these stressful times, parents often watch helplessly as their children are subjected to incredible pressure to attain the high levels of academic and sporting success required to gain entrance to universities and be selected for good jobs.



At the same time, a continuous flood of new technologies such as game consoles and cell phones, contrive to distract children from their studies. Due to their own work pressures, parents also often find it difficult to monitor and help their children through this confusing maze of diversions.

Mom's Little Guide to Nutrition for Students and School Children: Brain Health gives a basic guideline on how you can help. You can make a difference and offer your child the opportunity of achieving the best possible academic success through nutrition.



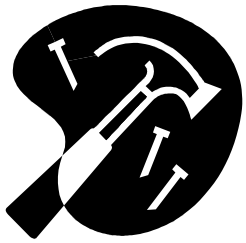
Unfortunately, there is no magic potion or an enchanted knowledge funnel, and your child will still have to do homework and study as well!

This booklet is the first in a range of health through nutrition guides which will appear over the next few months. For more information and future issues, please refer to the web site regularly:
www.staywell.co.za

Remember: if you or your children are experiencing any problems, please consult a qualified medical professional.

Best Staywell wishes!

INTRODUCTION



Did YOU know - The average human body contains enough:

- Potassium (K) to fire a toy cannon (0,2%),
- Phosphorus (Ph) to make 2,200 match heads (1,2%),
- Carbon (C) to make 900 pencils (18%),

- fat to make 7 bars of soap or 75 candles,
- Iron (Fe) to make a 7.5 cm nail (+/- 0,01%),
- Water (H_20) to fill a 40 liter tank (water makes up about 70% of your body),
- and enough Sulphur (S) to kill all fleas on an average dog (0,2%)?

The complete list includes a few more elements (some are found in the 'fats') such as hydrogen (H), nitrogen (N), calcium (Ca), chlorine (Cl) and sodium (Na). In addition we also contain traces of elements such as magnesium (Mg), cobalt (Co), copper (Cu), zinc (Zn), iodine (I), selenium (Se) and fluorine (Fl).

When you consider that we live, breathe, run around, think, feel happy or sad, speak, learn…. Well, isn't it just amazing to think that our insignificant little piles of phosphorous, carbon and potassium mix with a bit of iron and water (and a couple of other elements) to create warm, beating hearts and smart, thinking brains?

As yet we do not understand how our combination of chemicals can become alive. But through years of careful study and research, we have begun to understand that chemical principles and the laws of physics directly determine the quantity and the quality of our lives. **In other words, the balance and form of elements and molecules in our bodies play a significant role in determining how old we will become and how healthy we will be.**

How do the essential elements, chemicals and molecules get into our bodies? There are normally three ways in which anything can enter our bodies:

- Eating
- Drinking
- Breathing.

Believe it or Not! What we eat and drink determines the chemical balance in our bodies and this in turn, determines whether we feel fit and healthy and enjoy life, or if we become sluggish, depressed victims of the next germ-attack!

THE BODY

The Body is a complex, finely tuned organization of inter-linked systems. Each system is dependent upon every other system. At the same time, as each system does its job, it sends messages which communicate what is happening so that the body's functions are maintained and any problems can be addressed rapidly.

The brain is the commander of all the body's systems and resources. Messages are sent to and from the brain at great speed using either hormones travelling in the blood or electrical signals sent via the nerves.

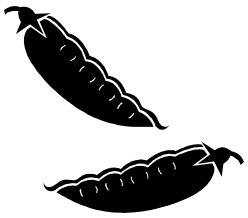
Looking more closely, we discover that hormones are **chemical molecules** acting as the body's carrier pigeons. And if we look even more closely, we

discover that even the electrical impulses travelling through our nerves like a high-speed data link to and from the brain, are transmitted using tiny but very distinct **movements of atoms or molecules (chemicals)**!

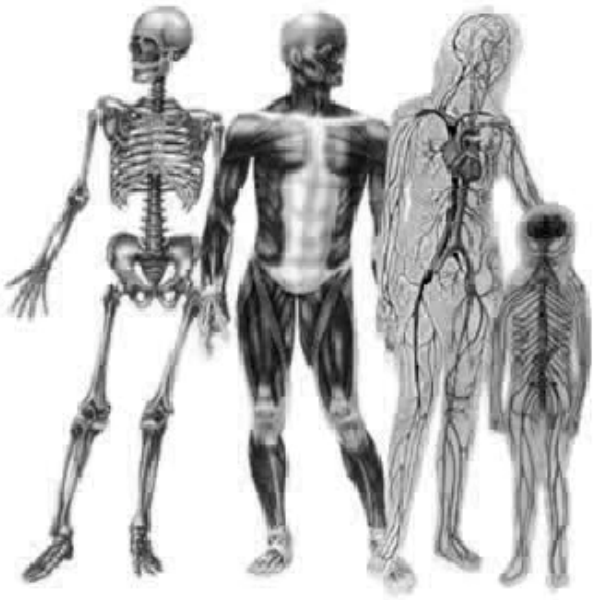
So once again, it is clear that the balance of the chemicals in our body and in our brain (for which the only source is what we eat and drink) determines how well our brain can function, how well the signals can be transported throughout our body, and therefore how fit, **how SMART** and how HEALTHY we are!

Some of the distinctly recognisable systems that make up the human body include:

- Digestive System (Mouth, alimentary canal, stomach, intestines, rectum and anus together with auxiliary systems such as the salivary glands, gall bladder, liver, pancreas)
- Respiratory System (Pharynx, larynx, trachea, bronchi, lungs, diaphragm)
- Cardio-vascular system (Heart, veins, arteries, capillaries, blood)
- Nervous System (Brain, Spinal chord, nerves)
- Skeletal System (Bones, cartilage, tendons - skeleton)
- Muscular System (Muscles, ligaments)
- Immune System
- Lymphatic System
- Reproductive system
- Integumentary System (Hair, skin, nails)
- Endocrine System (hormones, endocrine glands)
- Urinary System (kidneys, ureters, bladder, urethra)



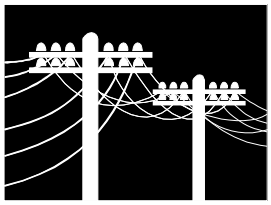
Muscular System



Nervous System

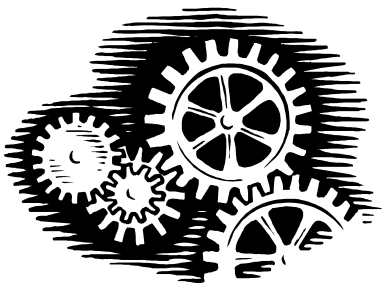
Skeletal System

Cardio-Vascular System



Inter-linked Systems

We have already mentioned that the body's systems are closely inter-linked. Each system is dependent on every other system for messages which tell it when and how to work.



For example, your muscles (***muscular system***) cannot work if your ***digestive system*** is not providing food or nutrients to the muscle cells to burn for energy. The nutrients are transported from the digestive system to every cell throughout the body by the blood vessels (***circulatory system***). When the nutrients in the blood become depleted a messenger

(hormones = ***endocrine system***) is sent to the brain (***nervous system***). The brain then gives you a strong urge to eat, which we call hunger. Eating and digesting food increases the level of nutrients in the blood and switches off the hunger pains.

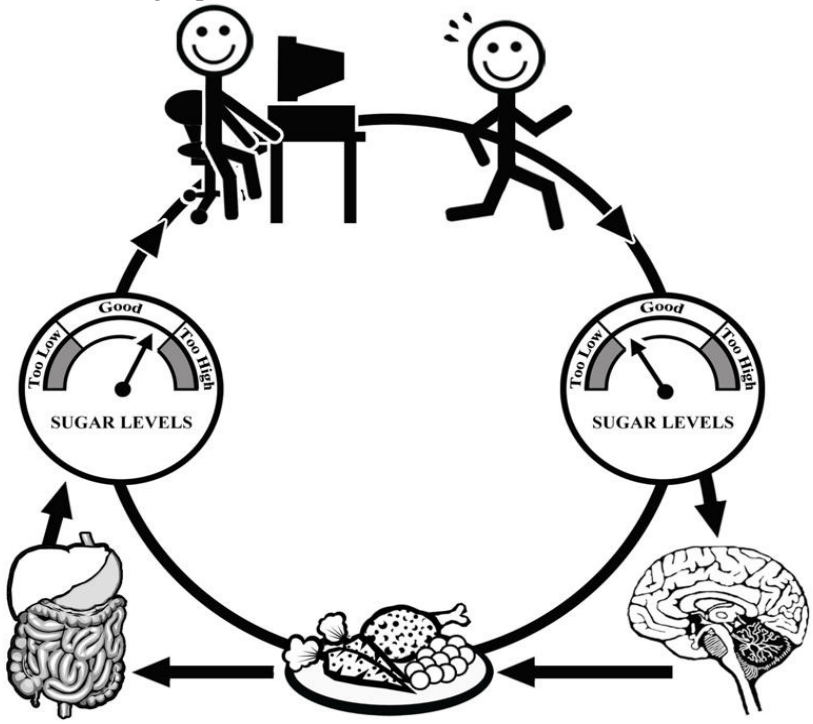


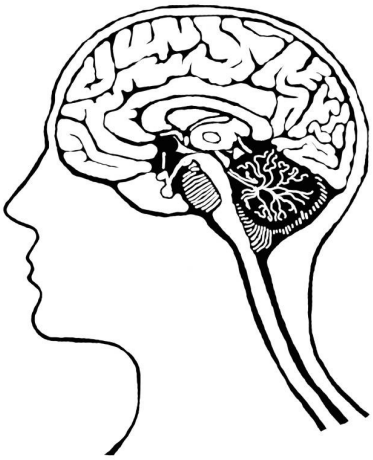
Fig 1: Inter-linked Systems in the Human Body

The body even has emergency systems which kick in, to protect us when we are threatened. If your hand touches a hot stove, your brain gets an emergency signal and even before you feel the pain, your brain has already told your muscles to lift your hand off the stove.

If you cut yourself, the brain immediately sends an army of special blood cells to the blood vessels around the cut. Some of these special cells get sticky and clump together, causing the blood to coagulate (clot). In this way your body saves your precious blood and prevents you from losing any blood unnecessarily. Some of the other special blood cells stand guard around the cut, attacking any unknown cells entering the body through this unauthorised entrance and which may be germs or may be a threat to the body in some other way.

If all of our body's systems are working properly, we feel healthy and have lots of energy to complete our daily tasks at home, at school and at work.

THE BRAIN

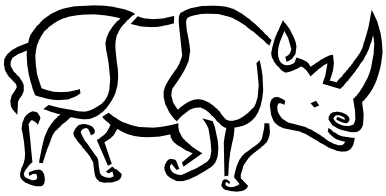


ATTENTION!

Meet the Supreme Commander of your body – your Brain.

The human brain is a soft, dull-grey organ consisting mostly of fats. It weighs about 1,5 kg in a normal adult. It is usually a little larger in men (+/- 1260 cm^3) than in women (+/- 1130 cm^3) but this is not always so. The brain is the most important organ in the body and controls ALL the other bodily functions. In fact the brain controls all the actions we are aware of like walking, eating, talking, feeling hungry or sleepy and so on as well as those we are not aware of like our heart beat, breathing, the digestive process, temperature regulation and many more.

A full-grown Rhino weighs about 1 ton (1 ton = 1000 kg) and its brain weighs only about 35 grams (0,035kg). At birth, a human baby weighs around 4 kg and the brain is already around 450 grams (0,45kg). In other words, even at birth a human baby's brain is more than **10 times** larger than that of an adult Rhino. An adult human's brain is more than **30 times larger** than that of an adult Rhino, even though the Rhino weighs more than 10 times what we do on average!



It is clear that the brain is what differentiates human beings from other species in the animal world. Even though the human brain does not look terribly impressive, it is an absolute marvel of versatility. The more we study the brain and learn new things about how it functions, the more amazed we become!

It is astounding to discover that in pregnant women, the developing baby uses more than half of all the nutrients it receives from the mother, to develop its brain! Is nutrition even **more important** for the brain than we thought? The answer is an emphatic **YES!** A developing foetus' brain requires proteins, carbohydrates, vitamins, minerals and *essential* fats. Four specific types of essential fats known as ALA, DHA, EPA and DGLA make up about 20% of the substance of the human brain. In fact, these fats are **so important** to the development of the baby that the foetus will literally strip the mother's brain of hers, if there are not enough available in the blood stream. If the mother's diet does not contain sufficient of these *essential* fats to replace those needed by her baby, her own brain will even shrink to meet her baby's brain's needs!

Having a plentiful supply of all the required nutrients and in particular the *essential* fats, is not only critical to the health and functioning of the brain in the foetus but to the human brain at every stage of development.

So much so, that science has proven that the amount of essential fats in the umbilical chord of a baby at birth, will determine the child's ability to think at the age of 8!

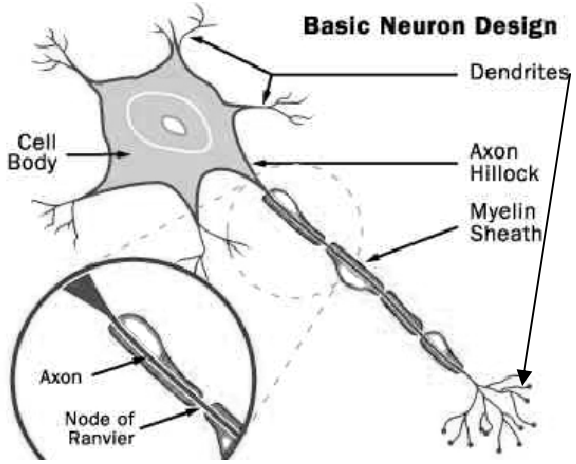
This trend continues after birth. When a child is 8 year old, the levels of homocysteine in its blood (a clear indicator of whether your child is receiving enough vitamin B or not) can be correlated to his or her academic marks.

How the Brain works

Brain Cells and Connections = Neurons and Dendrites

Like the rest of the human body, the brain also consists of cells. The brain's cells are a bit different from those of other organs and are called *neurons*. Neurons also make up the nerves which conduct messages to and from the brain. When a baby is born, its brain already has many millions of neurons. Until the age of two, a baby's brain furiously continues to create new neurons until it finally has about 100 BILLION (10000000000 or 10^{10}) of them!!!

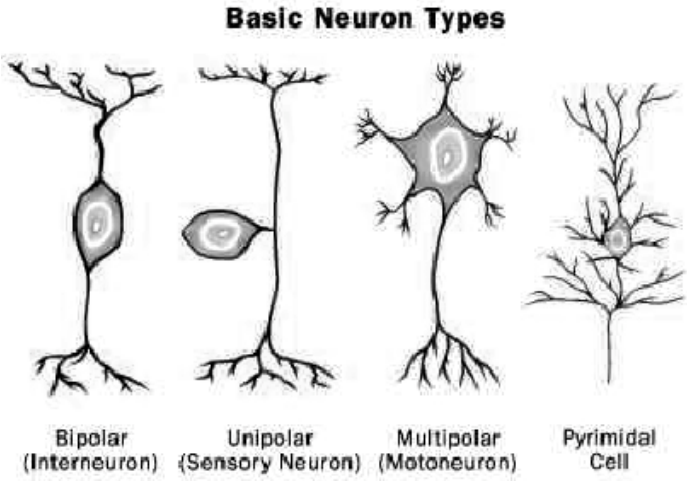
By now it will come as no surprise that a significant portion of every neuron consists of *essential* fats! Specifically, essential fats form the part of the neuron called the *myelin sheath* which is used to transport messages along the length of the cell. If a neuron's myelin sheath is damaged, the neuron may never recover or fulfil its purpose again.



In order to pass messages along, every neuron connects with many other neurons. These connections occur when one of the neuron's 'feeler's' or *dendrites* come into contact with another neuron, creating a bridge or *synapse*. The brain is like a continuously changing and growing net of neurons linked to one or many other neurons. *Dendrites* are created and dissolved every day, depending on what we need at that time. They hold together all the facts we learn, words and their meanings, physical skills like those we need for sports, mental skills like mathematics or the ability to solve puzzles and also memories. They also help us to understand the unwritten symbols of social interaction like raised eyebrows for surprise or a downturned mouth registering disapproval. Specific, primal parts of the brain called the *limbic system* enable us to feel and interpret emotions such as fear and anger. Because dendrites are created and removed as they are needed;

Exercising your brain = Smarter brain + better memory

At birth, the number of other neurons each neuron can connect to, may be as high as 2500. Within 2 to 3 years, this may reach 15000! No wonder toddlers appear to be fact-sponges! They are literally absorbing information at the rate of knots – or dendrites in this case – sometimes several MILLION every day. Their brains are casting their 'nets' of neurons connected to neurons connected to more neurons and gathering information with incredible speed.



There is still a lot of uncertainty exactly how dendrites and synapses relate to memory and intelligence. We know that at the onset of puberty, the number of synapses decreases, and unused synapses and dendrites are destroyed. Research appears to indicate that the brain needs to spring clean the extravagant, tangled net created in early youth, leaving behind a structured, highly organised and efficient network of connections which enable a young person to grow into a fully functioning adult.

Unlike any other organ in the human body, the brain is able to restructure itself continuously and even to repair some forms of damage. By exercising the brain and feeding it properly, we can continue to build and improve our intelligence and our skills throughout our entire lives!

The Neuron Connection

Brain cells or neurons do not touch one another directly. Instead, there is a tiny gap between each neuron and the next. In fact, it is rather like the gap in a car's spark plug. The gap between neurons is called a synapse. The synapse ensures that each message has a distinct beginning and an end. Each message is a clear and unique entity and does not overlap with the next. When a message is sent to or from the brain, a chemical or *neurotransmitter* travels across the synapse, passing the message from the sender to the receptor (receiver). Both the sending station and the receptor consist of *essential* fats.

The chemical (neurotransmitter) used to transport the message is different for each type of message sent. Most neurotransmitters are made from amino acids (the building blocks of proteins) in the brain. This process requires enzymes which use up vitamins, minerals and other nutrients in the process. Each amino acid makes a different type of neurotransmitter. For example, the amino acid tryptophan is used to make serotonin (the neurotransmitter that makes your child feel good). The amino acid phenylalanine is used to produce the neurotransmitters adrenaline and dopamine which help to keep your children enthusiastic and looking forward to tomorrow.

Feeding the Brain

Now that we have a better understanding of HOW the brain works, we can begin to understand WHY it is so important WHAT our children eat and drink!

Of course there are many factors such as genetics, environment, illness and so on influencing our children's ability to learn, their intelligence and their behaviour.

However, vast volumes of research prove conclusively that **we can improve** our children's (and our own!) built-in learning ability, behaviour and even intelligence by ensuring that they eat and drink the right foods at the right time. By making sure that our children obtain sufficient vitamins and minerals we can help them to maximise their brain's natural ability.

It has been proven that simply managing what your child eats and drinks during the day can help to improve your child's:

- concentration
- ability to understand and solve problems
- learning ability
- mood
- behaviour
- emotional status and
- Physical co-ordination!

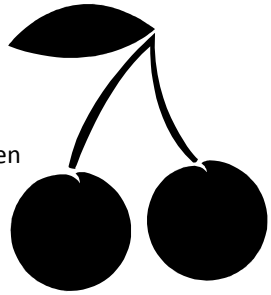
The "Food for the Brain Foundation" is a volunteer organization founded in Britian in 2005. It conducted a survey amongst 10 000 children between the ages of 6 and 16. The survey compared the childrens' diets with their academic achievements, their behaviour and their health. Visit their website at http://www.foodforthebrain.org for more information. The survey found (amongst others) that:

One out of every 3 children suffered from behavioral problems and a poor academic record and there was a strong correlation with poor eating habits.

"Some key findings of the survey were:

- Children who eat diets high in fried food or take-away foods cooked in hot fat, are 3 times more likely to behave badly.
- Children who eat vegetables, oily fish, nuts and seeds, do best at school.
- Children on the best diets have 11% higher academic scores than those on worse diets.

- The best foods to improve behavior are fruit and vegetables.
- Those children eating the most of both are twice as likely to be well behaved.
- The worst foods are fried take-away meals and processed foods, ready meals and sugar.
- A massive 44% of children, who eat this type of junk food, suffer from bad behaviour on most days, compared with only 16% of children who never eat fried or take-away food.
- Children, who ate nuts and seeds daily, did twice as well academically as children who didn't eat nuts and seeds at all.
- The best foods for good academic scores are dark green leafy vegetables, oily fish and water.
- The worst foods are processed foods and ready meals."



Every parent has observed how seriously negative feed-back (including poor marks, being left out of the sports team, not getting that desired part in the play and so forth) affects our children.

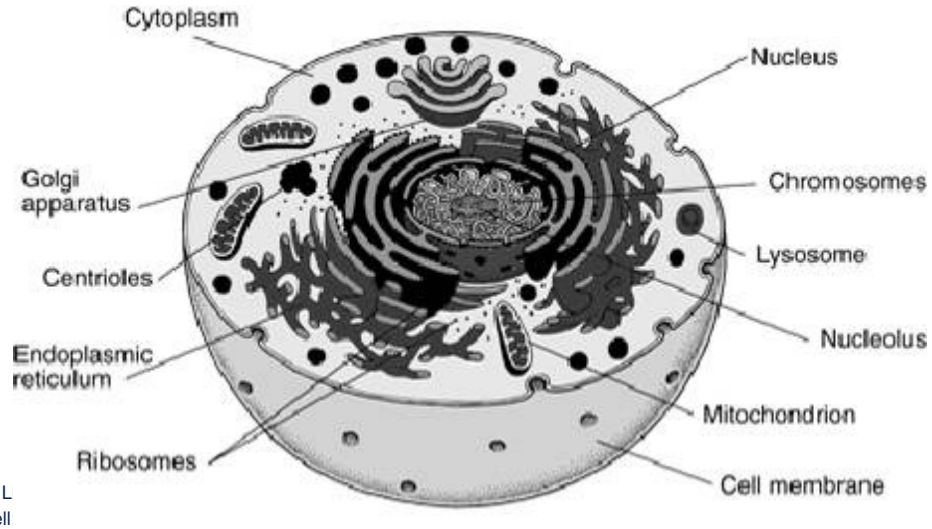
Positive feed-back cultivates self-confidence which in turn boosts our children to do well and achieve success. Obviously we want to do **whatever we can** to get our children out of the vicious cycle of failure and worthlessness into this upwards cycle of growth, acceptance and success!

Now we can begin to understand what is meant by the saying "You are what you eat". It is just as true to say that what you eat significantly influences the way you feel. We can also begin to see that what our child eats and drinks (or does NOT eat and drink) could make our child a new person!

The Sugar Trap

Every body and brain cell needs energy to function properly. The energy-providing fuel comes from the food we eat and drink. In fact, providing fuel for cell energy is the end-goal of our digestive system (See Diagram 1).

The fuel that is burned (*oxidised*) in each brain cell's 'generator' (the *mitochondrion*) to provide this energy is ***glucose***. Other body cells can also use other fuels, but the brain cannot burn (*oxidise*) fuels other than glucose. Oxygen is also required for the burning process. We breathe in air, and the oxygen is dissolved into our blood in the lungs.



Our bodies have a sophisticated system to warn us when the level of glucose in the blood is too low to provide all the energy needs – we become hungry!

When there is a surplus of glucose available, the body quickly stores it away for hard times ahead as glycogen in the muscles and some organs. If there is even MORE glucose available, it is stored as fat deposits for VERY, VERY hard times ahead (those unwelcome fat deposits we hate so much)!

How does the body achieve this? The pancreas has special cells (the Islets of Langerhans) which excrete a hormone called insulin when there is glucose in the blood. The insulin works a bit like a tourist guide for glucose molecules and will escort the glucose molecules throughout the body to cells which need energy or to the places where glycogen will be stored, or even to the fat deposit sites.

For a few million years, this system has worked very well as man seldom really had too much to eat. Even when they did, it was usually in the form of seeds and nuts or meat if the hunting season was a good one! This is the kind of diet our bodies were designed to cope with.

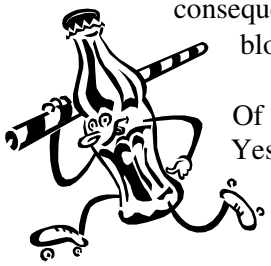
Nowadays however, we eat much more convenience food: Prepared foods such as microwave meals and fast-foods (take-aways), highly processed foods and lovely soft and sugary (but very unhealthy) refined foods.

All these modern convenience foods provide large amounts of glucose, although they often do not provide much else.

So where is the problem? Surely lots of glucose means we have lots of energy? True: when we have high levels of glucose in the blood, we do have a lot of energy. Sportsmen make use of this knowledge to ensure that they have an excess of energy when they need to perform well in matches. But if we are not sportsmen or undertaking strenuous physical exercise at work or leisure, we sometimes end up with too much energy and nowhere to 'spend' it. This can lead to problems of unacceptable behaviour, a short attention span and more. We can see this happening when we fetch our children from a birthday party and find all the little angels bouncing from the walls in what we call a 'sugar rush'. Is this beginning to sound familiar?

When the levels of glucose in the blood become too high, they can be dangerous and damage our blood vessels and nerves. The brain protects us from such potential damage. When it detects dangerously high levels of glucose in the blood the brain orders the pancreas to release an abnormally high flood of insulin. Now (unless we are undertaking strenuous physical activity which will burn the glucose quickly) large volumes of glucose are escorted away quickly (mostly to fat deposits).

This quick reaction of the brain and the body is almost like a 'panic attack' and is designed to protect us from long-lasting damage. As a result, too much blood glucose may be removed in a short period, resulting in low blood sugar levels. This unpleasant feeling which may be accompanied by feelings of tiredness and depression is sometimes called 'dumping'. Once again, the most common example we all know, is that birthday party we spoke of earlier. When we pick them up they are still high on the sugar rush, full of energy and all smiles. More often than not, by the time we get home, the same smiling children are tired, grumpy, irritated and completely irrational. These are the inevitable consequences of the body's very efficient and rapid removal of excess glucose from the blood – 'dumping'!



Of course, we already know what happens when the glucose levels in the blood drop. Yes, we become hungry! But this time, you may find that you experience an urgent craving and horrible hunger pangs as your body sends emergency messages to your brain that there is not enough energy around. Quickly grab a bar of chocolate or another sugary convenience snack and the entire cycle starts all

over again!

If you are concerned that your child may be trapped on the sugar see-saw, you can check by answering a few simple questions in the Blood Glucose Checklist.

Blood Glucose Checklist

Does your child (tick what is applicable):

- ☐ Usually eat white bread, white rice or pasta instead of the brown or wholegrain version?
- ☐ Crave sugar, sweets, chocolate, biscuits, toast and jam or instant cereals?
- ☐ Have several sugary foods or drinks during the day?
- ☐ Crave caffeinated and/or carbonated drinks such as colas?
- ☐ Sometimes skip meals, especially breakfast?
- ☐ Take more than the normal time to get going in the morning?
- ☐ Have energy slumps during the day?
- ☐ Sometimes lose concentration or have a poor attention span?
- ☐ Get dizzy or slow or irritable if they don't eat often?
- ☐ Seem to lack energy?

If you have ticked 5 or more of the boxes in the see-saw checklist, it may be time to stop the ride. Check your child's sugar consumption and make the necessary adjustments to keep the blood sugar levels nice and even.

From our examples and your own practical experience, you can see that fluctuating blood glucose levels – both too high and too low – influence our children's behaviour, their ability to reason, they become over-excited (hyperactive, mood) or tired (apathy, lethargy) and depressed (mood).

Now put yourself in a classroom situation where a single teacher has to deal with a large number of children, many of whom have:

- Either had no breakfast or
- Had only a bowl of highly processed, sugar-rich instant cereal to see them through the day.

Until 08h30 or 09h00 the children who had an instant cereal breakfast have so much energy that they do not know how to contain themselves. They cannot sit still, cannot concentrate and disrupt the entire class.

From around 09h00 onwards all these children have run out of energy and the ones without breakfast are running on their emergency tanks. They are irritable, cannot concentrate, pick fights with the teacher and with their friends, and generally make it impossible for anyone in the class to learn.

Unfortunately, when this kind of pattern becomes extreme, the affected children suffer greatly in their schoolwork. In addition, because classrooms have become stressful places (due to large numbers, low resources, high administrative requirements, etc) these children are often 'marked' by their teachers and their classmates alike. They become known as 'disruptive' or 'troublemakers'. Some may even be incorrectly classified as ADD or ADHD for no other reason than that they did not get the nutrition their brain needs to function normally!

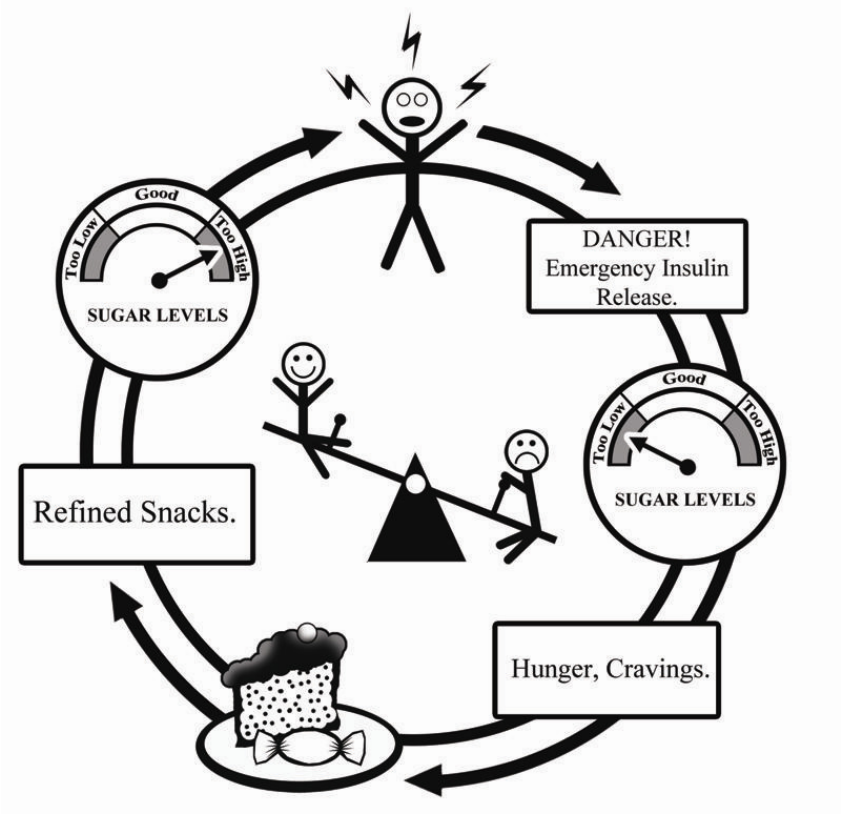


Fig 2: The Sugar See-Saw

DON'T DESPAIR!
It is NOT necessary to suffer through see-sawing cycles of hyperactivity and dumping.

The secret is to prevent the blood sugar levels from swinging wildly between dangerously high and excessively low.

- Eat regular, balanced and nutritional meals.
- Breakfast is REALLY the most important meal of the day!
- Instead of eating or snacking on highly processed, refined or sugary foods for a quick energy boost, rather enjoy something with a more stable and long-lasting nutritional value (e.g. proteins, complex carbohydrates such as whole grains, beans and vegetables as well as seeds and nuts).
- If you feel hungry between meals, raise your blood glucose levels gently by eating raw seeds or nuts, a small piece of game biltong, unsweetened natural yoghurt or fruit.
- If you regularly feel hungry between meals, try eating 5 to 6 well balanced, smaller meals during the day.
- Remember all the normal facts about healthy eating:
    - Cooking food at high temperatures or for extended periods destroys many of the nutrients.
    - Modern methods of packaging and processing foods lead to decreased nutritional value (e.g. white rice, brown and white bread, brown and white sugar, chemically treated fruits and vegetables, sweetened foods and drinks, carbonated drinks, milk with uncontrolled hormone levels, etc)
    - Storing fruits and vegetables for a long period of time decreases their nutritional value.
    - Burned or charred food may lead to an increased risk for certain cancers.
    - While healthy fats and oils (from seeds, nuts, fish and other sources of Omega 3, 6 and 9) are essential for the body's well-being, refined oils (usually clear vegetable oils) have virtually no nutritional value but pack an unhealthy fatty punch.
    - Trans fats (usually fat molecules damaged by heat) which occur mostly in deep fried foods are especially bad for us as they accelerate heart disease and obesity while at

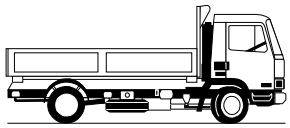
the same time blocking the conversion of essential fats into brain fats. Beware of chips, potato crisps, fried fast foods and fatty processed foods!

- Excessive hard fats (mostly animal fats) can lead to a variety of health problems.
- A good, daily nutritional supplement is a necessity.
- If you have any queries or problems speak to your doctor, pharmacist, dietician or other qualified health practitioner.

Once the sugar see-saw has been stopped, you will experience far fewer cravings and it will be easier to adopt healthier eating habits. However, a 'sweet tooth' is an eating habit which may require a bit of time and practice to control effectively.

You may want to consider substituting other sweeteners in the place of sugar while you are breaking the habit. For more information, refer to the 'Substitutes for Sugar' page.

WASTE REMOVAL



As the mitochondria in our cells 'burn' glucose to provide the cells with energy, waste products are formed. The process of 'burning' glucose is an oxidation process and results in atoms and molecules which are harmful to our bodies. These waste products therefore have to be removed or neutralised – sometimes both.

Anti-oxidants are powerful chemicals which assist the body in neutralising the harmful by-products of oxidation (energy creation in the cells). They play an extremely valuable role in maintaining the health of each cell and of the body as a whole. Ensuring that your child has a sufficient supply of anti-oxidants such as Vitamin C, Vitamin E, and others, is therefore always beneficial.

All waste products must be removed from the body sooner or later, even the neutralised ones. In very basic terms, the removal of waste products from the cells occurs in a similar manner in which nutrients are carried into the cells. The waste products are carried out of the cells by specially designated molecules (often anti-oxidants) and into the blood stream. Once in the blood stream, the waste products may be expelled through one of several ways which include:

- Voiding through the digestive tract (stool)
- Expulsion through the kidneys (urine)
- Expulsion through the skin (perspiration)
- Expulsion through the lungs (exhaling)

If the waste products of oxidation are not removed efficiently, they can cause damage to other cells and systems, or cause your child to become cranky or ill. If your child experiences any problems passing urine or breathing normally, consult a doctor immediately.

Constipation may also cause great discomfort and should be dealt with as quickly as possible. Stool should normally be soft and easy to pass without straining. If your child is experiencing difficulty or pain, this might cause them to delay going to the toilet, which only aggravates the problem.

Symptoms of constipation include: no bowel movement for several days (start watching after one day to prevent unnecessary delays and problems), loss of appetite, crankiness, abdominal pain, nausea, blood in the stool or underwear and so on. If your child is losing weight, vomiting, has a fever or abdominal swelling, consult a doctor immediately.

Eating less highly refined (sugary or starchy) foods and more raw fruit and vegetables should help significantly to prevent constipation. Drinking enough water is essential. If problems persist or become chronic, consult your doctor or pharmacist for advice.

Substitutes for Sugar

Not all commercially available substitutes for sugar are a healthy idea for your child. Check out some of these options.

Sugar: Because sugar is highly refined, it does not contain any minerals or vitamins. In addition all the naturally occurring fibre (roughage) has been removed. Eating a teaspoonful of sugar (including white, brown, caramel, crystals, lumps, etc) swamps the blood stream with glucose without any of the other nutrients required to make good use of it.

Fructose: The jury is split on the relative benefits and detriments of fructose. One advantage of fructose is that the body cannot use fructose directly – it requires several digestive processes to be transformed to glucose. This means that it takes longer to become available and the blood glucose 'flooding' effect of fructose is less pronounced than with sugar. The down side is that fructose may be more easily converted to blood fats and contribute to other health problems.

Acesulfame K: Relatively few scientific tests have been undertaken on acesulfame K and it should be avoided (or treated with extreme caution) until more evidence is available.

Aspartame: Aspartame is an artificial sweetener which is found in several of the well known brands. It is dangerous for diabetics and can become poisonous when heated. Side effects can include anxiety, headaches, unstable blood sugar, hunger and many more. There is a strong possibility that aspartame may trigger various types of cancer. Avoid using aspartame wherever possible.

Honey: The main constituents of honey are sucrose (sugar) and fructose. Using honey has a similar effect on the body as using sugar. The main difference is that if you use organic (which is also unheated, untreated, raw and pure) honey, there are some additional benefits such as the vitamins and minerals it contains. Pure, organic honey is therefore preferable to sugar but USE SPARINGLY!

Malt Extract: 'Pure' Malt Extract is usually made by boiling corn starch and treating with enzymes. Not much nutritional value left there! In addition, research has shown that Malt Extract has a **worse** blood glucose 'flooding' effect (*glycaemic index*) than sugar.

Saccharine: Saccharine was the first artificial sweetener to be developed in the late 1800's. Its basic ingredient is benzoic sulfinide, a coal tar derivative. There are indications that saccharine may be carcinogenic (cause cancer).

Stevia: Stevia is a herb growing in South America. Its leaves are naturally 30 times as sweet as sucrose, so the extract can be up to 300 times as sweet as sugar. It has been used in food and medicine by South American peoples for over 400 years and modern tests have proven that it is very safe indeed. Stevia does not influence blood glucose levels and contains no calories. It even appears to have some health benefits such as reducing plaque and helping to control blood glucose levels. Stevia is available from health shops in various forms including powder and a fluid extract.

Sucralose (Splenda): No long-term studies of side-effects in humans are available. It is understood that the manufacturer's own short-term tests on rats showed enlarged livers and kidneys and shrunken thymus glands!

Xylitol: Xylitol occurs naturally in many fruits and vegetables and is even produced in the human body. Xylitol contains very few calories (does not make you gain weight), is safe for diabetics, excellent for children with ADHD/ADD and has several beneficial side effects. Xylitol has been used since the early 1960's and appears to be a safe alternative for sugar. Xylitol is expensive, but as it has a concentrated sweetening effect, a little goes a long way. Xylitol is known to cause loose stools sometimes, and particularly in men.

EXERCISE

Exercise is a complete topic on its own and is not covered in detail here.

For the purposes of this booklet, it is important to highlight the role of exercise in providing nutrients to the cells of the brain and removing potentially harmful waste products.

Exercise increases the flow of blood through the body by increasing the heart rate and by mechanical means (muscles expand and contract, placing pressure on the blood vessels and encouraging the flow of blood).

By increasing the flow of blood through our bodies, we are ensuring a constant, fresh supply of oxygen and glucose for oxidation, as well as vitamins, minerals and various nutrients required for other processes.

At the same time, an increased flow of blood also encourages the removal and expulsion of waste products.

One of the greatest benefits of regular exercise is the natural increase in serotonin (the *feel good* chemical) and dopamine (*enthusiasm and optimism*) production in the brain. These are neurotransmitters which are essential to our health and well-being. Refer back to 'The Neuron Connection' (page 10) for more information.

Exercise is therefore a critical component of balanced, wholesome nutrition!

REST

Rest is at least as important for a healthy brain and optimal brain function as blood sugar levels, nutrition and exercise. The brain needs enough restful sleep (especially the deep, Slow-Wave and Rapid Eye Movement stages of sleep) to recover from the day's exertions.

The brain uses sleep - this period during which only the basic systems keeping the body alive are maintained - to undertake repairs and maintenance, as well as a few crucial functions that quite literally ONLY occur while we are sleeping! Examples of processes which occur while we sleep include the secretion of Human Growth hormone, Testosterone and Melatonin into the blood stream. In addition, our hair grows while we sleep.

In his book *Healthy Sleep Habits, Happy Child* (1999) Dr Marc Weissbluth (MD) quotes several studies which proved that

- Children with higher IQs -- in every age group studied -- slept longer.
- For ADHD children, improvements in sleep dramatically improved peer relations and classroom performance.
- Healthy sleep positively affects neurologic development and appears to be the right medicine for the prevention of many learning and behavioral problems

Most importantly for children is that sufficient, sound sleep is essential for a strong and healthy immune system!

ALLERGIES

One final point to remember when creating healthy meals for your child is the issue of food allergies. The topic is too large and too important to cover in detail here.

Suffice to say that it is important to beware of food allergies in children. Apart from the potentially deadly allergic reactions which cause anaphylactic shock (swelling of the tongue or throat, inability to breathe, dizziness, etc), food allergies can cause your child to suffer from a variety of symptoms such as asthma, eczema, ear infections, sinusitis and so on. **However, food allergies can also cause many of the symptoms related to reduced brain function** (including slow thinking, anxiety, depression, hyperactivity, learning disabilities and many more).

If your child is constantly complaining of aches and pains (tummy, limbs, headache, etc), or suffering with a runny nose, tonsils, airway (bronchitis) or skin problems, please take the possibility of food allergies seriously. Speak to your pharmacist or doctor who will help you decide how to determine whether your child is allergic to certain foods or not, to identify the specific foods and to find ways of removing them from the diet.

Foods that are most often related to food allergies can include: Wheat (gluten – also found in other grains), milk and milk products (including milk, yoghurt, cheese, chocolate etc), eggs, yeast, shellfish, nuts, peanuts, garlic and soya.

Many children also show intolerance or sensitivity for, or display allergic reactions to certain colourants, flavourants and preservatives. Studies have shown that these substances (such as tartrazine and MSG) influence a child's behaviour and can detract from their ability to focus.

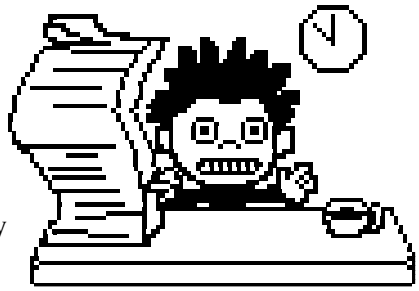
An allergic response puts your child's entire body on the alert – ready to go to war against unwelcome intruders. The reaction uses up significant amounts of resources (nutrients, energy, detoxification and communication systems, and more) and leaves the body exhausted and vulnerable.

It makes sense to AVOID exposing your child to allergic reactions wherever possible.

EXAMS – The Prowling Beast

Exam times are probably some of the most stressful times our children experience. Stress has a detrimental effect on our bodies as it causes the body to use vast amounts of nutrients and energy in an effort to cope.

In a stress situation, the body also releases adrenaline which prepares the body for the so-called '*fight or flight*' reaction.



Originally, this reaction was intended to enable our forefathers to have incredible energy at their disposal if they were in danger and either needed to stand and fight, or to flee for their lives. Our forefathers therefore used up the energy which was made available in this way and lived to experience another day. In the process, they also neutralized the effects of the adrenaline.

Nowadays, we seldom use the energy made available by the 'fight or flight' reaction. An excess of Adrenaline in the body is toxic and can lead to:

- Anxiety
- Insomnia
- Jitteriness
- Fear, phobias, stage fright
- Nervousness
- Tinnitus
- Etc.

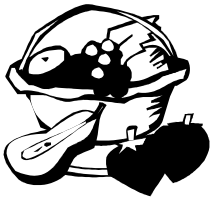
Even worse, stress causes the body to release the hormone cortisol which is also toxic to the body and may contribute to such unpleasant effects as:

- A suppressed immune system
- Insomnia
- Excessive fatigue, lethargy and obesity
- Mood swings,
- Damage to neurons which may result in reduced memory, especially long term
- Etc

This at a time when your child needs his or her memory and brain function the most!

- Reducing your child's stress levels is thus particularly important during exams.
- Avoid any foods and drinks which encourage stress-like reactions such as coffee and tea, excessive sugars and refined foods, chemically based 'energy' drinks, medication to stay awake, etc.
- Ensure that your child's body is able to deal with unavoidable stress by providing additional nutritional supplements and slow-release energy foods (such as whole grains, whole foods, fruits, vegetables, seeds and nuts).
- Avoid the sugar see-saw – keep blood glucose levels within healthy limits.
- Encourage your child to participate in mild exercise throughout exam periods as this not only releases built-up stress levels and unused energy but also increases blood flow. This increases nutrition to body cells and the brain while at the same time improving the removal of waste products.

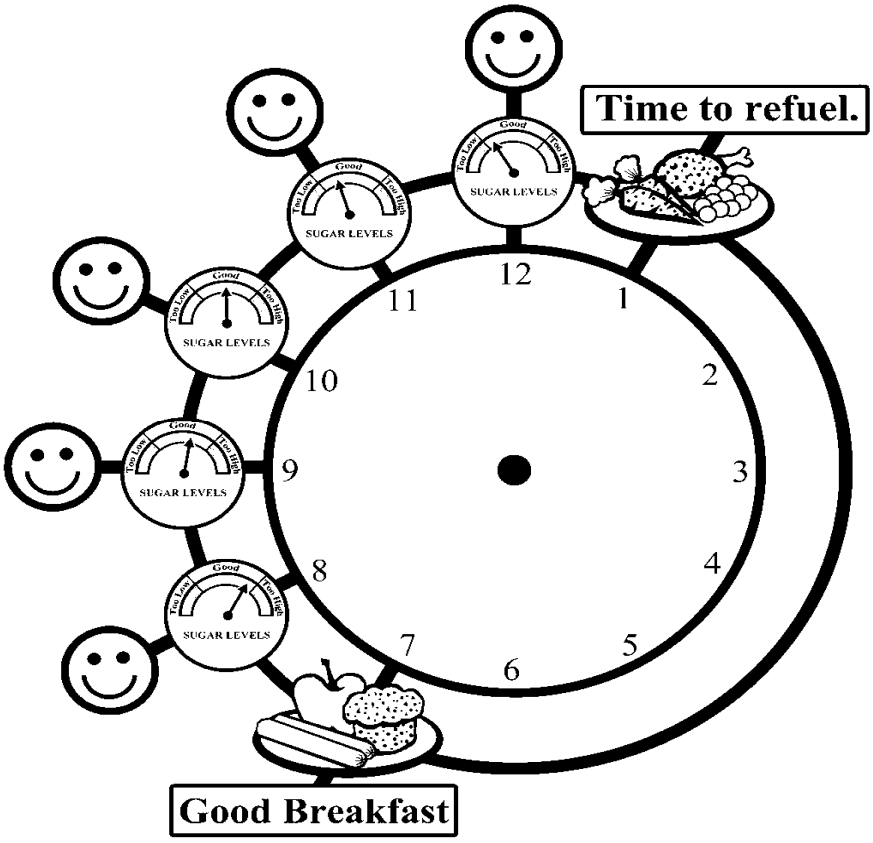
EXAMS – Nutrition for Results



Let us summarise what we already know about nutrition for the brain:

- The brain consists mostly of fats
- Brain cells need energy just like all other body cells
- Cell energy is created by the burning (oxidization) of glucose (from the digestive system) in the presence of oxygen (from the lungs)
- Communication between brain cells occurs via chemicals, which come from the food we eat
- Too low levels of blood sugar cause the brain to send out a signal – we are hungry
- Low blood sugar levels cause us to feel sluggish, tired, depressed
- Hunger turns into pangs and cravings when the blood sugar levels are dangerously low
- Too high blood sugar levels are dangerous – the body reacts by secreting larger amounts of insulin than normal thereby reducing blood sugar levels quickly.
- This sometimes results in an 'emergency' blood sugar too low situation (dumping) and starts a vicious cycle of hyperactivity and dumping if highly refined or sugary foods are eaten.

Fig 3: Nutrition for Exams



In order to ensure that our children achieve the highest possible success during exams, it is important to avoid the sugar see-saw and rather provide nutrition that will slowly and steadily supply the glucose required over a long period of time.

When feeding your child for good exam results, the following guidelines will help:

- Avoid stress as much as possible
- Ensure that your child ALWAYS eats a good breakfast of proteins (egg, sausage, fish, etc), whole grain foods such as whole wheat bread or oats porridge, fruits, natural yoghurt, seeds and nuts
- Sweeten whole grain porridge with xylitol or fructose rather than sugar to extend the availability of energy as long as possible
- Avoid instant cereals as these provide a quick rush of sugar which is rapidly used up, 'dumping' your child right in the middle of the morning exam.
- Avoid tea, coffee and soft drinks which also provide a quick 'high' but just as quickly dump your child into the next 'low'
- Use unsweetened fruit juice or herbal tea for added benefits
- The best drink of all is still water which is needed by the brain and the body to function properly.
- Provide a lunch box of wholesome snacks (no sweets, cakes, white or brown bread, etc) especially if your child has to write an exam after recess or participate in sporting activities after school. Include proteins (such as egg or biltong), fruits, unsweetened yoghurt, wholegrain bread, seeds and nuts etc
- Encourage mild exercise and good sleeping habits.

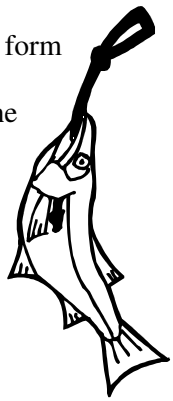
Staywell™ BrainHealth

As parents ourselves, we understand only too well that it is not always easy to provide healthy meals that are balanced and contain all the nutrients our children require. That is why we have developed BrainHealth.

BrainHealth contains all the nutrients you and your children require for optimal brain health and function. It can be used with confidence by children and adults of all ages in times of particular stress (like exams) AND throughout the year.

The Staywell BrainHealth product has been carefully formulated based on all the latest available scientific research. It is a comprehensive product containing all the nutrients required by the brain to function optimally.

In addition, BrainHealth has been manufactured using a breakthrough in new technology. The tasty, granular formulation makes it easy to use as you can simply spread one or two scoops (always adhere to the correct dosage) over your child's porridge or yoghurt in the morning before school.



The **absolutely *essential*** Omega-3 required by the brain is included in the package in the form of softgel capsules, By far the best source of Omega-3 is still fish oil and it is almost impossible to remove ALL the fish taste from the oil. It therefore cannot be included in the BrainHealth granular formulation (which has a lovely, chewy chocolaty taste and consistency). DO NOT leave out the softgels!! Your child's brain MUST obtain sufficient Omega-3 to be effective. See Tips on Swallowing Softgel Capsules for more information on how to use softgels effectively.

This booklet contains much more information on how you can assist your child; offering him or her the best possible prospects of achieving success in their exams. If you are not able to undertake everything listed here, take heart:

Simply taking BrainHealth at least one month before the beginning of exams and during the exams will already help your child to improve concentration, memory and overall learning ability.

It is important to point out that some of the nutrients included in Brain Health exceed the RDA (Recommended Daily Allowance). However, ALL the nutrients are at levels which are WELL WITHIN scientifically determined safe limits. Nevertheless, DO NOT increase the dosage, as doing so may cause some nutrients to exceed safe limits!

IMPORTANT NOTE: BrainHealth should NOT be used in conjunction with anti-depressants unless under the strict supervision of the prescribing specialist!

BrainHealth is extremely safe for use together with other medication. If your child is using other medication, you may find that this may be reduced while using BrainHealth. Do not change or reduce any prescribed medication without consulting your prescribing physician or specialist.

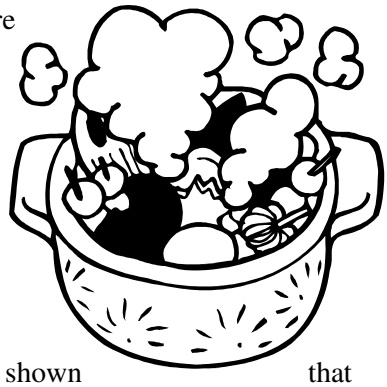
The following nutrients are contained in BrainHealth:

Major Brain Nutrients		
Nutrient	Symptoms of Deficiency	Food Source
Vitamin B1	Poor Attention levels Poor Concentration	Whole grains, vegetables
Vitamin B3 (Niacin)	Depression Psychosis	Whole grains, vegetables
Vitamin B5 (Pantothenic Acid)	Excessive Stress levels Poor Memory	Whole grains, vegetables
Vitamin B6	Depression Excessive Stress levels Irritability Poor Memory	Whole grains, bananas
Vitamin B12	Confusion Poor Memory Psychosis	Meat, Fish, Dairy products, Eggs
Folic Acid	Anxiety Depression Psychosis	Green, leafy vegetables
Vitamin C	Depression Psychosis	Fresh fruit, vegetables
Magnesium	Depression Insomnia Irritability	Green vegetables, nuts, seeds
Manganese	Convulsions Dizziness	Tropical fruit, seeds, nuts, tea
Zinc	Confusion Depression Lack of Motivation Poor Concentration Loss of Appetite	Fish, oysters, nuts, seeds

Vitamin B1

The direct result of a Vitamin B1 deficiency is a disease called Beriberi which can cause neurons (brain and nerve cells) to become inflamed and which can cause them to function poorly.

This immediately makes it clear that Vitamin B1 is essential to ensure optimal brain function and health.



We can obtain some Vitamin B1 from certain foods such as brown rice and brazil nuts but eating too many carbohydrates (sugars and refined starches), as well as stress deplete our reserves significantly.

Vitamin B3 (Niancin)

Vitamin B3 or niacin is a real miracle memory booster. Studies have shown that memory can improve up to 10% simply from obtaining sufficient amounts of Vitamin B3.

Vitamin B5 (Pantothenic Acid)

Vitamin B5 or Pantothenic Acid is also a potent memory booster as it is essential for creating the neurotransmitter acetylcholine which is the 'memory' messenger.

Vitamin B5 is also needed to produce the stress hormones, so excessive stress will cause depletion of Vitamin B5 in the body.

Vitamin B6, B12 and Folic Acid

Together, these nutrients are responsible for a critical process in the formation of *neurotransmitters*. Without these nutrients, the body's messages cannot be transmitted across the synapses (gaps between neurons).

Stress causes us to use a lot of Vitamin B6 and Folic Acid, and can lead to deficiency.

The effects of deficiency in any of these nutrients can lead to impaired brain function (including learning and memory functions) and mental health disorders.

Vitamin C

The benefits of Vitamin C are so far reaching, that we can only touch on some of the most important aspects here.

Vitamin C helps to protect the body (and the brain) from many of the negative effects of stress, anxiety, pollution, incorrect eating habits, injury and illness, and so on.

Vitamin C may also help to improve your child's mood, learning ability, memory and may even improve some aspects of intelligence!

It is therefore well worth supplementing your entire family's Vitamin C intake throughout the year!

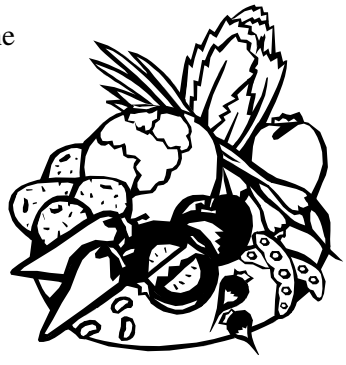
Magnesium

Magnesium may be the second most deficient mineral after Zinc (refer Zinc). Together with Calcium, Magnesium maintains the body's communication system as it helps to transport nerve signals throughout the body. Not only that, but Magnesium is an integral part of the structure of neurons.

Magnesium is crucial for brain health as it assists the brain to relax, helps us sleep well and improves the quality of sleep we enjoy.

A deficiency in magnesium can increase sleep disturbances (insomnia, nightmares, etc), restless legs syndrome, poor concentration and restlessness, ADHD and ADD, headaches (including migraine), anxiety, aggressiveness and many more.

Green leafy vegetables will provide some Zinc as zinc forms a part of the chlorophyll molecule. The best dietary sources of Magnesium are probably nuts (Hazelnuts, almonds, brazil nuts, cashew nuts) and seeds (especially unroasted, unsalted sunflower and sesame seeds)



Note: if you take calcium and magnesium at the same time, the body will first absorb calcium and some of the magnesium may not be absorbed. Take smaller amounts of magnesium throughout the day and separately from calcium for best results (taking magnesium just before going to bed may improve the quality and quantity of sleep).

Manganese

Manganese is a mineral which the body finds it hard to absorb, and which is easily excreted. The result is that most of us have a deficiency of the mineral in our bodies. Especially where the body contains high levels of copper, this can displace Manganese and compound the problem. Brain related problems associated with low levels of Manganese include insomnia, restlessness and irritability. Manganese deficiency may also increase the occurrence of convulsions as well as dizziness and vertigo (inner ear disturbances).

Many soil types are deficient in manganese. The more alkaline the soil, the less manganese will be found in the food grown in it.

Zinc

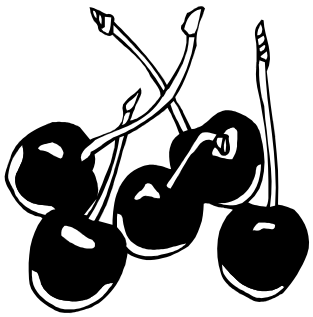
Sufficient Zinc is critical to optimal mental health and functioning. Unfortunately zinc is generally scarce in African soils, and therefore we have to ensure that we supplement generously. It is generally accepted that we need about 15mg of Zinc per day in order to ensure that we do not become deficient.

Zinc has been **proven** to contribute to an **improved** attention span, improved abstract reasoning, the brain's learning processes and memory – **all of which are crucial aspects for children to be successful during exams**!

Zinc deficiency can contribute to a vast array of brain-related problems including ADHD, Autism, eating disorders (such as loss of appetite, anorexia nervosa and bulimia), depression, irritability, various mental health conditions and many more.

Other Nutrients in Brain Health

BrainHealth is a very comprehensive formulation containing all the special nutrients required by the brain in optimal quantities (as indicated by scientific studies to date). In addition to the nutrients listed and explained, BrainHealth also contains many other nutrients which have been shown to be important for various aspects of the brain's structure and function. A summary of the nutrients and their potential benefits is included here for completeness. **If you require any further information, please consult your pharmacist or your doctor**.



Additional nutrients contained in BrainHealth include:

- 5-HTP to reduce anxiety, improve sleep and mood
- Betaine for improved mental function
- Choline for increased alertness and attention span
- Chromium for enhanced blood glucose level control
- Co-Enzyme Q10 to improve learning ability
- Ginkgo Biloba to protect against the negative effects of stress
- L-Arginine for improved memory and reduced anxiety
- L-Glutamine for optimal brain function (including learning and memory)
- L-Tyrosine for greater concentration, focus and memory
- Lecithin which contains several of the *essential* fatty acids the brain cells consist of
- Phosphatidylserine is one of the most important *essential* fats required for concentration, alertness, learning, memory and mood
- Taurine is a special amino-acid which helps to transport required minerals into the body's cells and unwelcome or toxic minerals out of cells. Taurine also plays a role in the production of *neurotransmitters*.
- Vitamin B2 (Riboflavin) for improved cell energy.

BrainHealth does not replace your normal, daily multi-vitamin and mineral supplement which you should continue to use according to the recommended dosage.

Important Notes:

1. **DO NOT use BrainHealth in conjunction with anti-depressants unless under the strict supervision of the prescribing specialist**
2. **BrainHealth is not intended to replace any medication you may be on. If you are under medical treatment, or if you have any queries, always consult your doctor or pharmacist for professional advice.**
3. **Some of the nutrients included in BrainHealth exceed the RDA (Recommended Daily Allowance). However, ALL the nutrients are at levels which are WELL WITHIN scientifically determined safe limits; DO NOT increase the dosage, as doing so may cause some nutrients to exceed safe limits!**
4. **All the nutrients included in BrainHealth are at levels recommended for optimum benefit according to scientific research results.**

Tips on Swallowing Softgel capsules

Softgels filled with Omega-3 (oily substance) are lighter than water and therefore float. As they are quite large, they should be swallowed with a relatively large amount of cool water to ensure that they move all the way into the stomach before dissolving. This prevents them from lodging in the alimentary canal (food tube) and causing possible discomfort. A drink of water or diluted fruit juice after swallowing will aid the softgel to reach the stomach easily.

If your child experiences problems swallowing the softgel, the fact that they float may be used to advantage. Test the following trick yourself and then teach your child how to do it too:

- place the softgel in your mouth.
- Quickly take a large mouthful of cool water (not large enough to feel unpleasant).
- Gently tip your chin forward onto your chest (this creates a pool of water in the front of your mouth with the softgel floating on top)
- Now toss your head backwards (tossing the water into the back of your mouth and throat in the process) and swallow.
- The softgel has disappeared without any trouble whatsoever!

Should you find that your child still has trouble swallowing a softgel, please try this alternative.

Mom's clever Omega-3 recipe:

- Lightly toast a piece of whole grain bread (wheat, rye or other)
- Pierce an Omega-3 softgel and spread the oil over the entire slice of toast, or as much as your child will eat at one sitting. Ensure that all the oil is used.
- If the toast is too dry a second softgel may be used (most western diets do not provide sufficient Omega-3 and the additional supply is not wasted), or a small amount of the olive oil from the sardines may be spread on the toast.

- Place a sardine (in olive oil) on the toast and spread according to preference.
- If required, add a pinch of salt to taste.
- Cut the toast into quarters or bite sized pieces (in the beginning it may be necessary to tempt your child by making the toast look appetizing)
- Serve immediately

If the sardine toast forms part of a breakfast or lunch meal, it may be spruced up (and the nutritional value increased) with a piece of cheese, slices of tomato or other vegetables, olives or a boiled egg. Any remaining sardines may be removed from the tin and stored in the fridge for use over a period of 2 -3 days.

BASIC RECIPE SUGGESTIONS

This section is by no means a complete recipe book. It is only intended to encourage you and your children to experiment with healthier options wherever possible. If you feel that you need more concrete ideas, please refer to any one of the many health and nutrition focussed recipe books which have become available in recent times.

Breakfast

It is not always easy to know what constitutes a good breakfast for school children and students. We would like to share a few ideas of suitable breakfast combinations that may provide sufficient, high-value and slow-release nutrients to help your child survive a hectic school day.

Whatever you decide to serve your child for breakfast, try to avoid falling into the morning rush-race as this places great stress on the entire family. Ideally you and your child should be able to eat breakfast restfully, chew well and prepare for the day mentally and physically. This is particularly true if your child is a slow riser or vulnerable in the mornings. If necessary, it is definitely worth trying to get up 10 minutes earlier to grant yourselves this valuable time together.

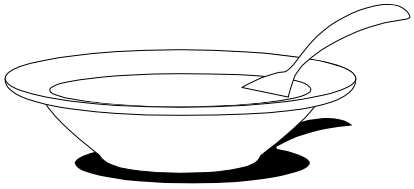
Breakfast Tips:

- Avoid instant, highly refined cereals (beware of bran cereals which also contain high levels of sugar although they are sometimes hidden)
- Replace refined foods such as bread and porridge with their wholegrain counterparts
- Avoid frying foods if possible. If you have to fry foods use olive oil (cold pressed) or similar alternatives which are not so easily damaged by heat.
- Fatty foods become very hot in the microwave, which can damage the fats, making them potentially toxic (poisonous) and carcinogenic (causing cancer). It is therefore better to heat fatty foods gently on the stove or microwave at low power.
- Fresh, raw nuts and seeds are better than their roasted and/or salted versions which will have lower levels of nutrients.
- Grind nuts and seeds yourself just before serving to prevent oxidation damage (rancid taste)
- Try sweetening wholegrain porridge such as oats with fruit instead of sugar
- Use unsweetened, low fat dairy produce (such as yoghurt) instead of the sweetened, whole milk variety.
- Whatever you serve, try to make the food look appetizing. After all, you have gone to a lot of trouble to prepare it (especially if you are rushed) and it deserves to be valued.
- If your child has a special mug or favourite plate, these might help to make another morning before school more bearable! Remember, good food can help, but it can never replace a bit of well-timed 'Mom-pathy'.

Oats Porridge:

Oats are an excellent source of dietary fibre to keep your child's digestive system healthy. Oats release their energy slowly and steadily and will help to see your child through to their snack break (recess). If the oats porridge is not sufficient for your child's needs, please add one or more of the other breakfast items suggested.

Prepare the porridge as per the instructions on the package. Bear your child's preference regarding consistency (whether they prefer thick or thin



porridge) in mind.

Variations:

- Sprinkle the cooked porridge liberally with cinnamon and sweeten with a little xylitol (TIP: xylitol tastes sweeter as it cools down).
- Sprinkle 1 Tsp of ground seeds (sesame, sunflower, pumpkin or pre-cracked linseeds) over the porridge before serving
- Serve the porridge with fresh fruit instead of milk and sugar
- Sprinkle the daily dose of Brain Health over the slightly cooled porridge and reduce the amount of sweetener accordingly.

Healthy Muesli

Make up a tasty mixture of whole oat flakes and mixed seeds and nuts in the ratio of approximately 4 cups of oats to 1 cup of mixed seeds and nuts (ground or flaked almonds, pecan nuts or other nuts, sunflower seeds, sesame seeds, pumpkin seeds, etc). Sweeten with a little Xylitol if desired. Keep in an airtight container.

Notes: Toasting the muesli will destroy a significant portion of the nutrients. Raisins have a very high sugar content and should be avoided.

Variations:

Serve with fruit such as berries, grated apples or pears, plums or apricots or sliced banana
Serve with low-fat, unsweetened yoghurt.
Serve as a breakfast sundae. Put a few slices of banana or other fruit into the bottom of a sundae cup, add half a cup of yoghurt and sprinkle a few tablespoons of the pre-mixed muesli on top.

Breakfast smoothie

If you just cannot find the time to have a relaxed breakfast (or on particularly difficult days) a breakfast smoothie followed by a peanut butter toast might do the trick.

Fruit in season (berries, banana, apples, peaches, plums, oranges, apricots or a combination of several)
1 tablespoon seeds per person (mixed or single – as preferred. Including sesame, pumpkin, linseed and sunflower)
½ - ¾ cup yoghurt per person
Fruit juice like apple juice to thin (if needed)

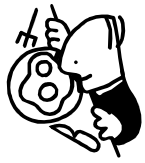
Grind seeds fine (an old coffee grinder is perfect).
Blend all ingredients and adjust the consistency with juice or water to taste.
Serve in your child's favourite 'special' glass!

Variations:

If your child does not like the idea of 'smooth' food, try serving the same ingredients in the form of a colourful, appetizing fruit salad with yoghurt 'cream'.

Scrambled eggs on toast

Make a lovely, light scrambled egg the way your children like it. Preferably use free range, organic eggs and olive or coconut oil for frying. Toast a slice or two of whole wheat or rye bread and serve the scrambled egg piled on top.



Variation:

For a change, prepare an omelette instead of scrambled eggs.
Another welcome change is to serve the egg in whole wheat pita bread instead of on toast.
Eggs can also be boiled or poached if preferred

Serve with grilled tomatoes, herbs, fresh cucumber, crudités or mushrooms for added flavour and colour.

Breakfast Proteins

If your child enjoys a hearty breakfast, you might want to try serving more proteins. Proteins can be served on toast, in pita bread or on firm whole meal porridge as preferred.

Some of the items you might try include:

Mince (last night's left-over's are fine)
Soya mince
Sausage (choose the healthiest you can afford)
Bacon (lean, lightly grilled, not charred)
Chicken
Fish (a traditional English breakfast includes kippers which are oak smoked fillets of Herring. Smoked Haddock is a delicious alternative readily available in South Africa.)

Toast with Peanut Butter

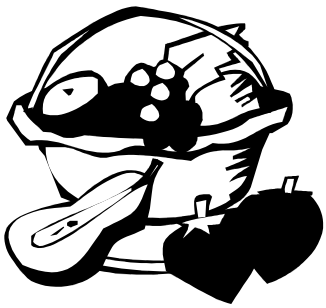
Peanut butter (unsweetened) is a very wholesome spread and offers your child a good dollop of proteins to sustain them during the morning. You can make 'butter' from almost any nuts, and you can try making it yourself (simply buy fresh cashews, hazelnuts or almonds and grind them to a smoother or rougher paste according to taste).

The nutrition 'trick' is to use whole grain bread, avoid adding additional fat by spreading butter or margarine as well as the nut butter onto your bread, and not to add syrup, honey, jelly or jam on top of the nut butter. However, why not try slicing half a banana or grating an apple onto your child's peanut butter toast?

Snacks for a healthy Lunch box

Now that you have decided what to feed your child this morning, you are immediately faced with the next hurdle – what to put into the lunch box?

Here are a few ideas for wholesome snacks.



- Whole grain bread (wheat, rye, oat cakes, etc) with
  - Cheese
  - Cottage cheese (low fat)
  - Nut butter (unsweetened)
  - Tuna mayo (low fat)
  - Scrambled egg, omelette
- Crudités (vegetable sticks including carrots, peppers, cucumber, celery, sugar snap peas, baby corn, radishes, etc)
- Fruit
- Yoghurt
- Boiled egg
- Cold chicken or left-over meat
- Small piece of game biltong (game biltong contains much less fat than beef biltong or dried wors)
- Handful of olives, nuts, dried fruit (beware: raisins have a very high sugar content and GI rating),
- etc

Lunch Box Filler:

Take two slices of low GI, whole wheat bread. Toast lightly if a firmer texture is preferred. Spread tomato salsa on one side. Cover the salsa with a layer of thinly sliced cucumber. Now place a layer of crumbled tuna or left-over meat or chicken on top. Sprinkle sparingly with herbal salt or pepper to taste.

Lunch Box Booster:
Take a piece of Mozzarella cheese and cut into finger sized rods.
Cut a firm vegetable or fruit (e.g. carrot, cucumber, celery or pineapple) into strips of more or less the same length and half the width of the cheese

Place one piece of cheese and one piece of fruit/vegetable next to one another and wrap tightly with a half slice of sandwich ham.
If necessary, fasten together with a small piece of toothpick.

Variation:
If your child prefers a slightly more piquant flavour, spread marmite, olive paste, hummus or tahini onto one side of the cheese. Place the spread away from the vegetable (to prevent the salt drawing water from the vegetable as it will go limp and unpleasant).
Alternative: use a more strongly flavoured cheese.
Alternative: use salami instead of sandwich ham.

Lunch

Lunch can present as many problems to a busy Mom as breakfast does. Between getting the children home from school and dropping them all off for various sports and extra mural activities, together with a long list of Mom-tasks, getting everyone fed is a mission!

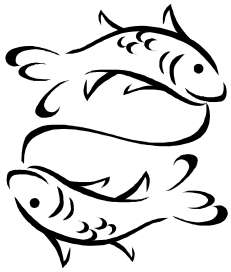
Through digestion, foods release their energy into the bloodstream at varying rates. Carbohydrates (sugars and starches) are the first to be available. Highly refined foods (such as white and brown bread, white rice and white maize meal as well as sugary foods, drinks and snacks, etc) usually make glucose available easily and quickly, leading to high blood sugar spikes. In highly active children, the blood sugar may be needed to provide energy for all their activities. However, care should still be taken to prevent blood sugar from reaching dangerously high levels by reducing the intake of refined carbohydrates (for example one slice of bread instead of two) and supplementing this with a slow-release food such as a protein or vegetables or a slow-releasing fruit (e.g. apple, pair, citrus, berries) instead.

Proteins and fats release their energy more slowly, and help to keep blood glucose and energy levels stable. Proteins and fats should therefore be included in every meal, but should not be the major component.

Lunch Tips:

- Active children need more energy from their food than inactive children. If your children participate in strenuous or extended sporting activities, they can eat carbohydrates and fast releasing fruits (e.g. banana, watermelon, paw-paw, raisins) off-set with an animal or vegetable protein (meat, poultry, fish, beans, lentils, etc).
- Sedentary children should avoid fast releasing foods as they will not have sufficient opportunity to use the available blood glucose before it is removed from the blood by insulin, to be stored as fat.
- Try using whole foods instead of refined (whole wheat bread, whole wheat pasta, brown or wild rice, etc)
- If eating a full meal at lunch, the proportion of vegetables and salad on the plate should be at least 50% (half) while the starch and protein should take up no more than 25% (one quarter) each.
- Leftovers make excellent lunch ingredients. Create delicious ‘pizza-wiches’, salads, casseroles and soups using last night’s leftovers (see some ideas below).
- Remember to ensure that children get enough water to keep their digestive, excretory and heat-regulating systems functioning effectively.

Fishy-Treat (use for a meal and keep leftovers for the lunchbox):



Ingredients:

1 big tin pilchards in tomato sauce	1 cup rolled oats
1 medium sized onion	1-2 eggs
Oil for frying	Salt, pepper and parsley to taste

Take one big tin of pilchards in tomato sauce. Tip the pilchards into a mixing bowl with all the tomato sauce. Flake the pilchards finely using two forks. Do not remove the bones or the innards as they have been cooked soft enough not to pose any dangers and they represent an excellent source of calcium and other nutrients. Chop the onion finely and add to the fish. Add the egg(s) and the oats and mix well. Add salt, pepper and parsley (or other herbs) to taste. Leave to stand for 30 minutes.

Preparation:
Heat a heavy bottomed pan with a little olive oil. When the oil is hot (not smoking – oil that is too hot is a major source of potentially toxic oxidants), spoon tablespoon-sized portions of the mixture into the pan. Fry lightly on both sides (around 5 minutes per side), remove and serve hot as a main meal or cold as a sandwich or lunch-box filler.

Main Meal:
The fish cakes already contain quite a high amount of carbohydrates from the oats as well as the tomato sauce. Therefore try serving with steamed carrots or broccoli and a fresh salad.

Alternative:
The fish cakes are also delicious served as a patty in a fish burger (Note: use whole wheat or Low GI buns, not white or brown!
If the taste of pilchards is too overpowering for young children, replace half with flaked, left-over white fish.

Delicious 'Leftover' Lunches

Leftover meat or vegetable proteins:

- Pizza-wiches: Toast a slice of low GI, whole wheat bread. Do not butter the toast as this only provides unused calories and the flavour is not required. Spread a layer of the protein (mince, chicken, lentils, beans, etc) over the toast. If required, moisten with tomato sauce or mayonnaise, or spice-up with mustard or horseradish. Add salt and pepper to taste. Sprinkle grated cheese over the top (hard cheeses such as Mozzarella have a lower fat content than Gouda or Cheddar) and pop under a grill to melt the cheese.
- Cook some whole grain pasta (or use last night's leftovers). Heat a little oil in a pan, finely chop some onion and sauté until soft. Add the leftover meat or vegetable protein to heat. Stir in the pasta and allow to heat through. Beat one egg per serving with a tablespoon of milk per egg and pour over the mixture. Stir gently until the egg is set but still soft.
- Use the left-over protein together with low GI, whole grain carbohydrates and vegetables in any combination that your family loves.

Leftover vegetables:

- Use left-over vegetables to make tasty frittatas (cook an omelette as normal. Add small bits of left-over vegetables to the top when the egg mixture is about half cooked and allow to heat through. Add salt, pepper and herbs to taste).
- For a delicious, instant soup, heat vegetables gently in chicken or meat stock until just warm. If preferred, add thinly sliced, low-fat viennas or left-over meat for extra taste and texture.

TERMINOLOGY

Anti-oxidant: A particle which is able to stabilise or neutralise an oxidant, preventing it from causing damage to cells in the body. Nature has provided us with many potent anti-oxidants such as Vitamins C and E, Beta-Carotene, Selenium, Lipoic Acid, Co-enzyme Q10 and many more.

Dendrite*:* The place where two neurons (nerve and brain cells) come together. They never touch directly but are separated by a gap (synapse). At the dendrite, messages are passed from one neuron to the other neuron by means of chemical substances called *neurotransmitters*.

Enzyme*:* A range of natural proteins produced by all living organisms. Enzymes are biochemical catalysts , each enzyme helping the body to convert one specific molecule into another substance. Enzymes are essential to life because they allow metabolic reactions to take place much faster than normal, while the enzyme itself remains unchanged.

Essential*:* A nutrient which can NOT be made in the body (it **has** to be obtained from food or drink) is referred to as *essential*. For example, DHA found in fish oil is an *essential* fat.

Free Radical: see Oxidant (below)

Glycaemic Index*:* A unit of measure designed to indicate how quickly or slowly a specific type of food releases its energy in the body. Sugar is an example of a food with an extremely high Glycaemic Index (releases glucose very rapidly over a short period) while oats have a much lower glycaemic index (release their energy slowly over a long period).

Metabolism: Each individual process together with the result of all the chemical processes occurring within a living cell or organism that are necessary for the maintenance of life.

Mineral**:** Minerals are micronutrients. This means that we only need small amounts to remain healthy. In nutrition terms, each mineral is a single element and the only way we can obtain minerals is by what we eat or drink. To make matters worse, many soils are deficient in various minerals and therefore the fruits and vegetables grown in that soil no longer contain the vital minerals.

Mitochondrion: The mitochondrion is a body inside each cell which is responsible for 'burning' or oxidising the glucose and converting it to energy for the cell to use. The harder a mitochondrion works, the higher the rate of metabolism of the cell. By-products of the oxidation process (energy creation) are free-radicals which pose a threat to the body as they can damage the mitochondrion and the cell if not neutralised effectively (see anti-oxidants).

Neuron*:* The special cells making up the brain and nerves of the nervous system.

Neurotransmitter*:* Neurotransmitters are chemical substances which carry the body's messages from one neuron to the next over the gap (synapse). Neurotransmitters are mostly derived from amino acids which are the building blocks of proteins.

Nutrient**:** particle required by the body in order to obtain energy and to function effectively. Nutrients include carbohydrates, vitamins, minerals, proteins (amino acids), and water.

Oxidant*:* A range of particles resulting from the body's metabolic processes. Often referred to as 'free-radicals'. Oxidants may also result from frying food as well as pollution, smoking and other processes. Oxidants are highly unstable particles and destabilise other particles and molecules, causing damage to cells,

Oxidisation*:* The process of 'burning' glucose for fuel in the body. Oxidisation is also the process by which other materials are burned (e.g. fuel in vehicles, wood in the grate, charcoal in the 'Webber' and so on)

Synapse*:* The gap between one neuron and the next. Because the nervous system has to transport many different kinds of messages, each by means of a different *neurotransmitter*, the synapse is a clever way of ensuring that each message is transmitted accurately and completely before the next one is transmitted.

Vitamin**:** Vitamins are also known as micronutrients together with minerals. Vitamins are organic molecules. Some vitamins may be made in the body, but most must be obtained through eating and drinking. Vitamins are vital to enable the body to undertake all its tasks efficiently (in other words, to stay fit and healthy).