

TABLE 1: VITAMINS AND MINERALS

The following Table 1. outlines key vitamins and minerals and some good sources of them.

VITAMINS and MINERALS			
Type	Sources	Needed for...	Notes
Vitamin A (fat-soluble)	Milk. Cheese. Egg yolk. Fatty fish. Dark orange or green vegetables (carrots, pumpkin, silverbeet, kale). Orange fruits (rock melon, apricots, peaches). Liver.	Prevents eye problems. Promotes healthy immune system. Growth & development. Healthy skin, teeth and soft tissues.	Too much Vit A is dangerous because it builds up in the body. Don't take supplements.
Vitamin D (fat-soluble)	Manufactured by body from sunlight on skin. Liver. Egg yolks. Fish oils. Vit D is added to some foods.	Strengthens bones and teeth by helping body to absorb calcium. Immune function. Muscle strength.	Essential to prevent osteoporosis. People who have poor mobility or are obese are at risk. GP checks levels & prescribes supplements if Vit D levels are low.
Vitamin E (fat-soluble)	Nuts & seeds. Vegetable oils. Green, leafy vegetables. Avocados. Egg yolks. Whole grains. Wheat germ. Margarine.	Helps protect cells & tissues from damage. Muscle health. Red blood cell health. Useful for managing LDL cholesterol.	High doses increase blood thinning. Supplements must be ceased before surgery & dental work.
Vitamin K (fat-soluble)	Leafy green vegetables. Dairy products. Broccoli.	Essential for blood clotting.	Need to be cautious when on blood thinning medication such as Warfarin.
B Complex Vitamins • B12 • B6 • Thiamin (B1) • Niacin (B3) • Riboflavin (B2) • Folate or Folic Acid (B9) • Wide range of foods. (water-soluble)	Leafy green vegetables – spinach, broccoli, asparagus. Fish & seafood. Red meat. Poultry. Dairy products. Eggs. Dried beans. Legumes – peas, lentils. Whole grains. Soy foods. Vegemite. B vitamins are added to some breads, cereals, rice.	Assist body make protein & energy. Important for many body functions, e.g., making red blood cells, brain & nerve cell function, heart & muscle function, health skin, vision, DNA production.	Stored in only very small amounts in the body. Needed in the daily diet.
Vitamin C (water-soluble)	Oranges, grapefruit, guava (+juices). Red berries. Red & green capsicums. Broccoli.	Helps absorb iron, copper & calcium. Helps form collagen (tissue that holds cells together). Healthy bones, teeth, gums, & blood vessels. Helps fight infection. Aids wound healing. Brain function.	Not stored in body. Needed in the daily diet.
Calcium	Dairy products. Dark green leafy vegetables. Bony fish. Fortified soy foods. Fortified breakfast cereals.	Vital for building & maintaining strong bones and teeth. Muscle, heart & nerve function.	Important in the prevention of osteoporosis.

Iron	Red meat, pork, chicken, fish & shellfish. Lentils, beans, & soy foods. Leafy green vegetables. Raisins. Wholegrain cereals. Sometimes added to cereals & grain products.	Helps red blood cells carry oxygen to all tissues in the body.	Anaemia can result from too little iron – symptoms include fatigue, weakness, shortness of breath. Menstruating females require adequate iron to compensate for loss.
Magnesium Copper Phosphorus Potassium Zinc	Wide range of foods. Whole grains, nuts & seeds. Vegetables. Fruit. Legumes. Dairy. Meat. Fish & seafoods. Soy foods.	Assist in energy production & making proteins. Muscle & nerve function. Heart function. Bone & teeth building. Cell membrane function. Regulation of blood pressure. Water balance in tissues. Growth. Immunity. Healing.	

You are not expected to remember all the information in the Table! However, the information is there so you understand how important it is to eat a wide range of healthy foods to get all the nutrients needed for bodies to function properly.

TABLE 2: MAIN PARTS AND ORGANS OF THE DIGESTIVE SYSTEM

MAIN PARTS and ORGANS of the DIGESTIVE SYSTEM	
Mouth	Tongue, teeth and salivary glands are contained in mouth which is lined by mucous membrane that secretes mucus to mix with food to make it easier to swallow. Mucus also keeps mouth moist and reduces infection.
Tongue	Made of muscular tissue and covered in mucous membrane and papillae that contain taste buds. Essential for taste, swallowing and speech.
Salivary Glands	Three pairs of salivary glands open into the mouth. They produce mucus and a watery secretion that contains enzymes to begin digestion.
Pharynx	Known as the throat. Is a muscular tube, lined with mucous membrane, that is the common path for air going to the trachea and food going to the oesophagus. When food and drink are swallowed, the muscular contraction of the pharynx closes the entrance to the trachea (wind pipe) and nasal cavity, ensuring that food and drink are directed to the oesophagus.
Oesophagus	Narrow, muscular tube (~25cm) that moves food from the pharynx to the stomach. It has a band of smooth muscle (sphincter) at its end that opens into the stomach when food is swallowed and then closes again to keep the food in the stomach.
Stomach	Is made of three layers of muscle and lined with mucous membrane. This structure allows food to be churned around (motility). Glands in the stomach lining secrete mucus, gastric enzymes and hydrochloric acid. These secretions form gastric juice that aids digestion. Opens into the small intestine at the duodenum.
Liver	Essential for many metabolic functions in the body. Produces and excretes bile. Is involved in the metabolism of carbohydrates, proteins and fats. Breaks down toxic substances. Is responsible for most drug (medication) metabolism.
Gall Bladder	Stores bile until needed for digestion and releases it into the small intestine. Bile emulsifies fats and neutralises acids in partly digested food.
Pancreas	The pancreas secretes pancreatic juice that contains digestive enzymes and produces important hormones, including insulin.
Small Intestine	Is the longest portion of the digestive system (4-7 metres) and is divided into three sections: duodenum, jejunum and ileum. Even though much longer than the large intestine, it is called 'small' because of its narrow diameter. It is where most absorption takes place using chemicals and enzymes secreted by glands, liver and pancreas. Food from the stomach is pushed through by muscular, wave-like motions called peristalsis. The inside wall is composed of wrinkled tissue and finger-like villi that increase the surface area for absorption of nutrients. Digested nutrients are absorbed by tiny capillaries (blood vessels) where they enter the blood and lymph circulatory systems and are transported to tissues and organs.
Large Intestine	Also called the colon. Is muscular and ~1.5 metres long. Absorbs any remaining water from undigested food and moves waste (faeces) along until ready for elimination. Intestinal mucosa secretes mucus which aids movement of faeces, together with peristalsis.
Appendix	A blind ended tube near the junction of the small and large intestines. Its function is unknown but is thought to maybe play a small role in immunity. It is a frequent site of inflammation and infection. Many people have it removed without any noticeable effect.
Rectum	Final straight portion of the large intestine. Acts as a temporary storage facility for faeces. As the rectum fills, stretch-sensitive nerves in the wall stimulate the desire to defaecate. Pressure forces the walls of the anal canal to open allowing faeces to enter and muscular waves (peristalsis) propel the faeces through.
Anus	External opening of the rectum. Opening and closing is controlled by two sphincter muscles.

TABLE 3: OUTCOMES OF NUTRITIONAL PROBLEMS.

There are many adverse outcomes of problems with nutrition. You do not need to remember all the details, but it is important to have some broad information about the impact of poor eating and drinking practices, and the consequences of inadequate nutrition.

The following Table identifies common conditions and their nutritional and lifestyle associations. You are likely to encounter many of these health conditions in your work because people with disabilities experience poorer health than the general population (Barr, Gilgunn, Kane & Moore, 1999; Osborn, 2000; Robertson et al., 2000)

HEALTH CONDITION	WHAT IS IT?	NUTRITIONAL and LIFESTYLE ASSOCIATIONS (associations do not always cause problems, but will increase the risk of developing a health condition)
Malnutrition	Body has inadequate, or excess, or wrong proportions of _____ and/or _____.	Unbalanced diet. Certain nutrients lacking. Excess intake of energy (_____). Problems with eating & swallowing. Problems with _____ of nutrients. Overeating. Dependence on others for nutrition.
Undernutrition	Body does not get enough energy (_____) and/or _____ for health	Inadequate diet. Certain nutrients lacking. Problems with eating & swallowing. Problems with _____ of nutrients. Dependence on others for nutrition.
Obesity	Too much food (_____) for body's energy requirements.	Diet high in _____. Low levels of activity. Excess kilojoules stored as fat in body.
Metabolic syndrome	Collection of risk factors (_____, high BP, high triglycerides, low HDL _____, _____ resistance) that increase risk of diabetes and cardiovascular disease.	Excess _____. High fat diet. Excess processed carbohydrates. Unbalanced diet. Excess sodium (salt). Low levels of activity.
Specific nutrient deficiencies → numerous problems with body tissues and organs	Refer to Vitamin & Mineral Table in Table 1 EXTRAS above.	Unbalanced diet. Diet lacking in specific _____ problems
Impaired immunity	Resistance to infection and disease is lowered	Malnutrition – undernutrition and obesity.
Type 2 diabetes	Disorder of _____ metabolism caused by low _____ production and/or lowered effectiveness of insulin (called insulin resistance).	Overweight & obesity. Unhealthy diet. Low levels of activity.

Hyperlipidaemia	High levels of fats (& triglycerides) in the blood.	Unhealthy diet. Lack of exercise. Excess alcohol. Some medications.
Hypertension	High blood pressure. Blood is pumped at a high pressure around the body and strains the heart.	Overweight & Excess sodium (salt). Low levels of activity. Smoking. Excess alcohol.
Heart disease (cardiac disease)	Refers to a collection of conditions caused by excess strain to the heart. Can result in heart failure or heart attack. Is a 'lifestyle disease', and is the top killer in the western world.	Unhealthy diet – high saturated and/or trans fats intake. Overweight & Low levels of activity. Excess sodium (salt). Smoking. Excess alcohol.
Stroke	Blood supply to the brain (by clot, fat embolus, or haemorrhage) is interrupted. Part of brain is then starved of oxygen resulting in brain damage. Functional impairments related to damaged brain area result (paralysis, impaired speech, swallowing, movement, etc.)	Unhealthy diet – high saturated and/or trans fats intake. Overweight & Low levels of activity. Smoking. Excess alcohol. Hyperlipidaemia. Heart disease.
Cancers	A large group of diseases characterised by uncontrolled growth of abnormal cells.	<i>Different associations with different cancers:</i> Unhealthy diet – low fruit & vegetables & whole grains. High intake of processed meats. Low levels of activity. Excess salt. Excess alcohol. Smoking. Environmental pollutants. Excess UV light (sun).
Diarrhoea	Increased frequency of bowel movements and/or loose bowel movements. Can cause dehydration and death if serious.	Infection caused by poor hygiene & poor food handling. Contaminated food. Nutrient problems (e.g., , IBS, IBD).
Constipation	Bowel movements that are infrequent or difficult to pass. Can lead to bowel blockage.	Insufficient fibre in diet. Insufficient fluid intake. Sudden changes in eating habits (e.g., dieting). Some medications.

Urinary tract infections	Bacterial infections that occur in the kidneys, bladder, ureters and urethra.	Insufficient fluid intake. <i>Note: Although not often the single cause, insufficient fluids can promote an environment for infection to flourish. Water flushes the urinary system.</i>
Oedema (fluid retention)	Excess fluid in body tissues. Symptoms include swelling of feet, legs & hands, body stiffness & aching, changing weight.	Excess sodium (salt). Some nutritional deficiencies (e.g., protein, vitamin B1). Some medications.
Osteoporosis	Loss of bone thickness (mass or density) caused by mineral loss. Increases risk of skeletal deformity and multiple bone fractures.	Low vitamin D. Low calcium. Lack of weight-bearing exercise. Smoking. Excess alcohol. Some medications (especially corticosteroids used for asthma). Nutrient problems (IBS, IBD).
Musculo-skeletal disorders	Refers to a large group of painful disorders affecting the muscles, tendons, ligaments, and/or skeleton, e.g., arthritis, bursitis, spine & joint dislocations & disease	Overweight & . Nutrient deficiencies. Low levels of activity. Sedentary lifestyle. Lack of fitness. Excess alcohol.
Sleep apnoea (ap-NEE-a)	Numerous brief episodes of breathing cessation when asleep. Caused by walls of the throat coming together or collapsing. Results in fatigue, irritability, poor concentration & daytime sleepiness.	Overweight & . Alcohol. Some medications.
Infertility	Inability to conceive (female) or contribute to conception (male) of child.	Unhealthy diet – high bad fats & processed carbohydrates. Nutrient deficiency, e.g., iron, vitamin D, iodine. Undernutrition. Smoking. Excess alcohol.
Oral (mouth) problems	Refers to problems with teeth, gums, salivary glands, tongue, and mucous lining.	Unhealthy diet – foods & drinks high in sugars and acids promote tooth decay. Sticky, starchy foods adhere to teeth and promote decay. Insufficient fluids – chronic dehydration causes dry mouth and promotes oral disease. Nutrient deficiencies – vitamins C & B12, iron, zinc, folic acid associated with ulcers & gum disease. Many medications – some cause dry mouth, some cause gingivitis (inflammation of gums.)

<p>Eye problems</p>	<p>Refers to eye problems related to nutritional deficiencies such as, preventable blindness, cataracts, macular degeneration, dry eyes.</p>	<p>Unhealthy diet – especially when low in fruit & vegetables. Nutrient deficiencies, e.g., vitamins A, C & E, zinc.</p>
<p>Psychological problems</p>	<p>Refers to a wide range of mental, cognitive, behavioural and emotional problems associated with nutritional problems. These include severe body image problems such as anorexia nervosa and bulimia, brain dysfunction, mood disorders, and emotional problems such as anxiety.</p>	<p>Nutrient deficiencies – can have a direct influence on brain function. All of the health conditions identified are associated with poor nutrition. In turn, all of those conditions can affect us psychologically – being ill or in constant pain affects people cognitively and emotionally. Being obese usually makes people unhappy. Poor nutrition affects overall wellbeing.</p>

TABLE 4: FATS - FACT SHEET

Fat

It is important to have some fat in our daily diet. Fats help us to absorb fat soluble vitamins and give our body essential fatty acids. But we need to make sure we don't eat too much and particularly the wrong type of fat. There are four main types of fat - **Saturated**, **Monounsaturated**, **Polyunsaturated** and **Trans fats**. Saturated and trans fats tend to increase levels of bad cholesterol and trans fats also reduce levels of good cholesterol, so we want to try to avoid these fats as much as possible. Monounsaturated and polyunsaturated fats tend to lower levels of bad cholesterol and can also increase good cholesterol, these are good fats to eat.

Types of Fats and their food sources

Saturated fats/ "bad" fats

Saturated fats are found mainly in foods that come from animal sources e.g. dairy products and meat. It is important to remember that you can also find saturated fat in palm and coconut oil. These oils are often used in processed foods such as pastries takeaway, biscuits and cakes.

Trans fats are found in foods that contain hydrogenated oils e.g. biscuits, cakes and fried takeaway foods. You can find small amounts in meat and dairy products, these are naturally occurring. Some margarines contain trans fats -check the labels.

Unsaturated fats/ "good" fats

Monounsaturated fats are found in olives, olive oil, peanuts, peanut oil, avocado, macadamia nuts, almonds, cashews, peanuts and their oil, and canola oil.

Polyunsaturated fats are found in sunflower, safflower and soybean oil, margarines made from these oils, nuts and seeds.

Omega-3 fats are essential polyunsaturated fats, which are found in fish, walnuts, linseeds and soybeans.

Ways to Reduce Saturated Fats

- Choose lean meat/mince and skinless chicken/poultry and trim all visible fat before cooking.
- Eat more fish and legumes.
- Choose low fat dairy products
- Limit added fats when cooking meat, chicken and fish by using low fat cooking methods such as grilling, barbecuing and stir-frying and using non-stick cookware.
- Add flavour by using herbs, spices, tomato based sauces and marinades.
- Cook meat-based casseroles in advance, cool and skim fat off with spoon.
- Replace butter and mayonnaise with avocado, hummus, nut spread or tahini.
- Avoid creamy sauces and fried takeaway foods.

- Only have cakes, chocolate, pastries and biscuits on special occasions or as sometimes foods.
- Choose processed foods that contain less than 10g total fat per 100g & less than 2g saturated fat per 100g.

QUICK TIPS	
Avoid:	Replace with:
Butter, cophera, dripping	Poly or monounsaturated marg or oil in small amounts e.g. canola, olive, sunflower or safflower oil. Avocado, hummus, tahini or nut spreads
Cream	Evaporated skim milk (e.g. for sauces, soups) Low fat natural yoghurt (e.g. for quiches, savoury pies) Blend ricotta cheese with low fat milk +add vanilla to sweeten (e.g. for a dessert)
Full fat cheese	Low fat cheese (<15g fat/100g) Small amount of grated low fat cheese Low fat ricotta/ cottage cheese Low fat cream cheese
Coconut milk or cream	Evaporated skim milk with a few drops of coconut essence Light or reduced fat coconut milk Canned coconut juice and add skim milk powder or evaporated skim milk
Salad dressings OR mayonnaise	Use low fat mayonnaise Use 99% fat free dressings
Chips and corn chips	Unsalted nuts Wholegrain crackers or rice crackers
Gravies and sauces	Use salt reduced gravy mix rather than making gravy from fatty pan juices Use tomato based sauces instead of creamy ones
Fatty Mince	Use low fat or lean mince Use legumes or beans (e.g. three bean mix, chickpeas, kidney beans)
Instead of:	Try:
Frying, sauteing	Use a non stick pan, use spray oil, BBQ or grill
Roast	Cook meat on a rack in a tray in the oven. Cover meat with foil to keep it moist. Brush vegetables with a small quantity of oil or spray with spray oil.
Baking	Use non stick tray or baking pan use non stick baking paper