



dnahealth
optimal nutrition for life

{ REPORT }

PATIENT NAME:

SAMPLE ID:

DATE OF BIRTH:

SAMPLE TYPE:

GENDER:

DATE COLLECTED:

REFERRING DOCTOR:

DATE REPORTED:

WELCOME TO YOUR DNA HEALTH REPORT

The recent explosion in genetic knowledge has revealed new connections between genes and health. In order to feel your best, it is important to make lifestyle choices that match your unique genetic make-up. This pioneering service allows you to make precisely such choices. This report will help you to adopt the lifestyle habits and nutritional practices best suited to your individual needs.

INFORMATION INCLUDED IN YOUR REPORT

SECTION 1. UNDERSTANDING GENETICS AND NUTRIGENETICS – an explanation of the connection between the genes covered by our screening and how they can relate to your well-being, including an explanation of how to read your genetic results.

SECTION 2. YOUR GENETIC RESULTS – This table presents the genes we test, your genetic results and their impact on different areas of your health.

SECTION 3. YOUR PERSONAL LIFESTYLE REPORT – singles out areas that require special consideration and suggests nutrition and lifestyle changes that can be made in accordance with your genetic profile.

SECTION 4. YOUR NUTRITION AND LIFESTYLE GOALS - this table provides recommendations based on your genetic profile.

SECTION 5. FAQs AND KEY TERMS – answers the most Frequently Asked Questions about our service and explains Key Terms used in this report.



SECTION 1. UNDERSTANDING GENETICS

Before reading your assessment, please take a few minutes to review this background information that will help you better understand your results and enhance the overall value you receive from the important knowledge contained in this personalized report.

WHAT ARE GENES?

A gene is a segment of the DNA (short for deoxyribonucleic acid) molecule that contains the instructions for how, when, and where your body makes each of the many thousands of proteins required for life. Each gene is comprised of thousands of combinations of four letters that make up your genetic code: A, T, C, and G. Each gene's code combines the "letters" A, T, C, and G in various ways, spelling out the "words" that specify which amino acid is needed at every step in the process of making the proteins required for your body to develop and function. Increasingly, your genes can also tell you whether you are predisposed to specific health risks.

WHAT ARE GENE VARIATIONS?

With the exception of identical twins, all people have small differences in the information their DNA contains, and it's these differences that make each of us unique. Gene variations are slight changes in the genetic code that are present in at least one percent of the population. For example, one genetic "letter" (A, T, C, or G) may be replaced by another. These variations can lead to different processes in the body, just as altering one letter in a word can completely change its meaning; for instance, from "g"oat to "c"oat. When the variation affects only one genetic letter, as in the goat/coat example above, it is called a "single nucleotide polymorphism" (or SNP, pronounced "snip").

ARE GENE VARIATIONS "BAD"?

For a given population, one genetic code for a given gene may be found more frequently than other genetic codes for that same gene. The genetic codes for those genes that appear less frequently are referred to as "variants." In most cases, these variants can increase our risk for a certain health condition, but in some instances the variants actually reduce our risk for a particular health condition. For example, under Bone Health one of the genetic variations we screen for is the "T Bsm1 C" variant of the Vitamin D Receptor (VDR) gene. In this instance, the absence of the variant is associated with lower bone density and higher bone fracture rates when dietary calcium is low, and so the presence of the variant reduces your risk of bone health disorders. Variations should not be thought of as "good" or "bad," rather, genetic variations are simply the differences in the forms of the genes present in our bodies. The key is to know which form of the gene you carry, so that you can make diet and lifestyle choices to best reduce your health risks.

WHAT IS NUTRIGENETICS?

Nutrigenetics is concerned with the effects of our individual genetic variations in response to our diet and other sources of nutrients. Nutrigenetics testing enables us to identify where we are on our journey toward achieving our individual, optimal health potential.

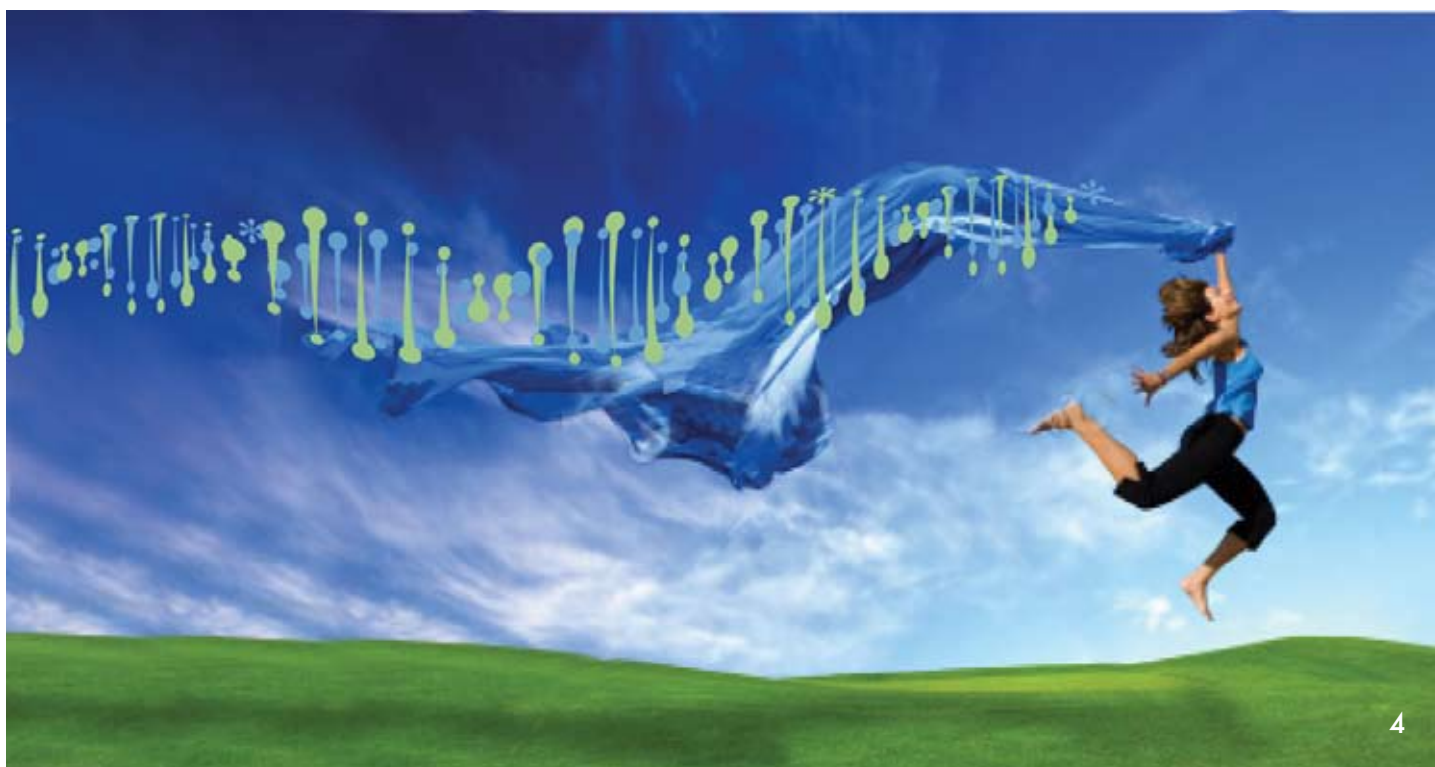
HOW TO READ YOUR GENETIC RESULTS TABLE

The table in Section 2. shows the results of your genetic screen. We took these results into account when drawing up the recommendations in Section 3: Your Personal Lifestyle Report.

- ⊕ The first column, "Area of Activity," gives the metabolic process in which the gene is involved
- ⊕ The second and third columns, "Gene Name" and "Variation" provide the name of the gene we analysed and the specific nucleotide region within that gene that we are looking at.
- ⊕ The fourth column "Your Genetic Results," shows your actual DNA sequence at this region.
- ⊕ The final column shows whether the specific variant of the gene you carry impacts on the metabolic process in either a positive or negative manner.

Gene variations uncovered by our screening process are not a sign of illness. In fact, these variations are quite common in healthy individuals, and some variations may be beneficial. Most people have one or more of these genetic features; however, identifying and analyzing your unique pattern of genetic characteristics makes it possible to adjust your diet and lifestyle to match your specific needs for maintaining optimal health.

Remember, your genes cannot change, but your lifestyle can. This is why we consider the two together; by identifying areas of your DNA that need attention, in conjunction with your current lifestyle, we can make recommendations for you to make those lifestyle changes where appropriate, and point to areas that may need a little more attention.



SECTION 2. YOUR GENETIC RESULTS

AREA OF ACTIVITY	GENE NAME	GENETIC VARIATION	YOUR GENETIC RESULTS	NEGATIVE IMPACT ON HEALTH
CHOLESTEROL METABOLISM	LPL	C1595G		
	CETP	G279A		
	APOA1	G-75A		
	APOC3	C3175G		
	APOE	Arg158Cys/Cys112Arg		
B VITAMINS	MTHFR	C677T		
		A1298C		
	MTR	A2756G		
	MTRR	A66G		
	CBS	C699T		
DETOXIFICATION	GSTM1	Insertion/Deletion		
	GSTP1	A313G		
	GSTT1	Insertion/Deletion		
INFLAMMATION	IL6	G(-174)C		
	TNFA	G(-308)A		
ANTIOXIDANT STATUS	eNOS	G894T		
	SOD2	A16V		
	SOD3	C760G		
BONE HEALTH	VDR	Fok1		
		Bsm1		
		Taq1		
	COL1A1	G1546T		
INSULIN SENSITIVITY	PPAR-y	Pro12Ala		

SECTION 3. YOUR PERSONAL LIFESTYLE REPORT

CHOLESTEROL METABOLISM

B VITAMINS

DETOXIFICATION

INFLAMMATION

ANTIOXIDANT STATUS

BONE HEALTH

INSULIN SENSITIVITY



CHOLESTEROL METABOLISM

Heart health depends on a complex balance of environmental, dietary and genetic factors. Certain genes influence LDL and HDL cholesterol levels; higher levels of LDL, or 'bad' cholesterol, and lower levels of HDL or 'good' cholesterol, are associated with a higher risk of heart disease.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO CHOLESTEROL METABOLISM

OMEGA-3 FATTY ACIDS: Omega-3 fatty acids reduce the risk of coronary heart disease and stroke. The benefits include a reduction in plasma triglycerides, blood pressure, platelet aggregation, and inflammation.

SATURATED FAT: Fat from the diet provides essential fatty acids the body cannot produce itself. These fats help the body store energy, insulate tissues and absorb fat-soluble vitamins and hormones. There are two main groups of fats, saturated and unsaturated. Saturated fats can raise LDL, or "bad" cholesterol levels; high LDL cholesterol has been linked to cardiovascular disease. In contrast, unsaturated fats have many healthy benefits.

CHOLESTEROL: Cholesterol is a substance our bodies need to function normally. However, too much cholesterol in the body can lead to the development of cardiovascular disease and stroke. Contrary to popular belief, most cholesterol in the blood is manufactured by the body itself, but foods also impact cholesterol levels. Saturated fat has the strongest impact on cholesterol levels, but foods rich in cholesterol and trans fatty acids also increase blood cholesterol, although to a lesser extent.

B VITAMINS

B vitamins provide building blocks for growing cells, which are constantly being renewed, and play an important role in many physiological processes. B vitamins also supply some of the chemicals necessary for protecting our genes, so that our DNA doesn't accumulate damage from the wear and tear in the daily lives of our cells. These vitamins – including folate and vitamins B6 and B12 – help make new DNA for cells that are constantly growing and renewing themselves. Folate is also involved in turning many genes on and off, and also helps repair DNA. Although B vitamins are required in only very small amounts, they are crucial for normal metabolism.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO B VITAMIN METABOLISM

FOLATE: Folate or folic acid in its synthetic form, together with B6 and B12 enables the synthesis of new proteins. It is necessary for normal cell function and tissue growth, for the production of red blood cells and for the synthesis, function, and protection of DNA. It is involved in the normal performance of many neurotransmitters that regulate mood and behaviour. Folate is also crucial in the proper metabolism of homocysteine.

VITAMIN B6: Vitamin B6 or pyridoxine plays a role in the synthesis and transformation of amino acids, in the multiplication of cells, and in the production of red blood cells, immune cells, and neurotransmitters. It is also required for the chemical reactions involving proteins. The higher the protein intake, the greater the requirement for vitamin B6.

VITAMIN B12: Vitamin B12, also known as cyanocobalamin, like other B vitamins, is important for cell growth and for the formation of red blood cells, as well as for the maintenance of the central nervous system.

DETOXIFICATION

Cruciferous and allium vegetables help increase the activity of your detoxification system, which aids the removal of harmful substances from your body.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO DETOXIFICATION

CRUCIFEROUS VEGETABLES: Cruciferous vegetables contain substances called glucosinolates that offer protection against certain illnesses, such as cancer and heart disease. These vegetables activate detoxification enzymes that help your body remove toxins.

ALLIUM VEGETABLES: Allium vegetables aid the body's detoxification systems, they also contain antioxidants. While all allium vegetables are beneficial for your health, most research has focused on the health benefits of garlic.

TOBACCO: Vast numbers of studies have established the causal relationship between the use of tobacco and cancer, cardiovascular disease, chronic obstructive lung disease, peripheral vascular disease and stroke.



“IT IS IMPORTANT TO ATTAIN AND MAINTAIN A HEALTHY BODY WEIGHT”

INFLAMMATION

Inflammation is a normal immune response and an essential step in tissue healing. The release of these inflammatory substances is controlled by genes that govern inflammation. However, when these genes are not 'switched off' the inflammatory response continues. An increasing number of common disorders, such as obesity, heart disease, arthritis and inflammatory bowel disease have been associated with an increase in these inflammatory processes.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO INFLAMMATION

OMEGA-3 FATTY ACIDS: Omega-3 fatty acids reduce the risk of coronary heart disease and stroke, but they are best known for their anti-inflammatory action. In addition to their effect on heart health and inflammation, the latest research also shows omega-3 fatty acids can help increase bone formation and reduce bone re-absorption.

BODY WEIGHT: Being overweight or obese has been shown to be pro-inflammatory. Achieving and maintaining a healthy body weight is one of the best ways to reduce inflammation and your risk for chronic disease.

ANTIOXIDATION STATUS

Free radicals can do great damage to our bodies; they attack DNA, proteins, fats and anything else they encounter in our cells. Free radicals have been linked to a variety of common disorders, including heart disease, chronic inflammation and cancer, as well as accelerated aging. Our bodies have genes that make antioxidants and are therefore built-in defenses against free radicals. This is seldom enough and dietary sources of anti-oxidants are required.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO ANTIOXIDANT STATUS

VITAMIN A: Vitamin A, also known as retinol or beta-carotene, helps in the formation and maintenance of healthy teeth, skeletal and soft tissue, mucous membranes and skin. It also generates pigments in the retina and promotes good vision, especially in dim light. Beta-carotene, is precursor to vitamin A, and is a potent antioxidant. The body regulates the conversion of beta-carotene to vitamin A based upon its needs.

VITAMIN E: Vitamin E (also know as alpha-tocopherol) protects unsaturated fats in cells from damage. It is also important in the formation of red blood cells and the use of vitamin K, which is essential for blood clotting.

VITAMIN C: Vitamin C is vital for the formation of teeth, bone, cartilage, and maintaining healthy gums. It also plays a significant role in supporting your immune system.

FRUIT AND VEGETABLES: Fruit and vegetables contain vitamins, minerals and fibre, as well as antioxidants and unique plant substances called phytochemicals, which give plants their color and flavour and may help prevent disease.



“CALCIUM IS VITAL FOR THE DEVELOPMENT AND STRENGTH OF BONES”

BONE HEALTH

Our bones are not a fixed structure. Our cells work continuously to dissolve old bone and create new bone tissue. After the age of 30, both men and women start losing bone mass; the loss is particularly marked in women after menopause. According to latest research both nutrition and genetic factors play an important role in determining bone health.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO BONE HEALTH

CALCIUM: Calcium is vital for the development and strength of bones. The body continually tears down and rebuilds bone to make calcium available for our vital functions. If we don't get enough calcium from food, the body takes calcium from the bones. When the body tears down more bone than it replaces over a period of years to get calcium, the bones become weak and fragile, and may result in osteoporosis.

VITAMIN D: Vitamin D maintains normal blood levels of calcium and phosphorus and aids in the absorption of calcium, helping to form strong bones. Although this vitamin is found in certain foods, it can also be created in the skin after exposure to ultraviolet (UV) rays from the sun. Without vitamin D bones can become thin, brittle, soft or misshapen.

CAFFEINE: Caffeine is a mild stimulant that affects the central nervous system. Moderate amounts of caffeine usually cause no harm, however in some people excessive caffeine can cause anxiety, insomnia, headaches or stomach irritation. Excessive caffeine can also negatively impact bone health as it can prevent the absorption of vitamins and minerals such as calcium.

INSULIN SENSITIVITY

Insulin is a hormone that stimulates the uptake of glucose from the diet into the blood. Those with lowered sensitivity to insulin have a limited ability to respond to the hormone's action. The scientific literature suggests that insulin insensitivity or resistance may play an important role in some of the most common disorders – including type 2 diabetes, high blood pressure, heart disease and disrupted fat metabolism.

DIETARY AND LIFESTYLE FACTORS RELEVANT TO INSULIN SENSITIVITY


REFINED CARBOHYDRATE: Refined carbohydrates are simple or complex carbohydrates that have been processed to remove a part of the original grain, usually the external husk that contains two-thirds of the nutritional content. A diet high in refined carbohydrates can trigger elevated triglyceride levels, reduce the levels of the "good" cholesterol and promote the accumulation of body fat. A diet high in sugar provides a large amount of kilojoules without the benefit of fibre, vitamins and minerals.


BODY WEIGHT: Being overweight or obese has been linked to an increased risk of insulin resistance and type 2 Diabetes. Achieving and maintaining a healthy weight is one of the best ways to reduce your risk for chronic disease and is the key to a longer, healthier life.



SECTION 4. YOUR NUTRITION AND LIFESTYLE GOALS

Having considered your lifestyle questionnaire and your genetic results, we recommend adhering to the following nutrition recommendations:

 YOUR RECOMMENDED INTAKE	SOURCE
Omega-3	Oily fish, such as herring, salmon, mackerel, trout, anchovy and sardines, are the richest sources of omega-3 fatty acids. Other fish – cod, hake, kingklip, haddock, and canned tuna – also contain these fatty acids but in smaller amounts. Among shellfish, oysters have high levels and prawns, crab and scallops have moderate levels. Vegetarian sources are flaxseed and flaxseed oil, canola oil, soybean oil, walnuts and walnut oil.
Saturated Fat	Saturated fats are found mainly in animal foods, and are usually solid at room temperature. They include full fat dairy products (such as cheese, milk, cream, butter and ice cream), fatty meats, the skin and fat of poultry and lard. Palm oil and coconut oil are also saturated.
Cholesterol	Dietary cholesterol is found only in animal foods such as egg yolks, dairy fats, organ meats, beef, chicken and shellfish. Vegetable oils are cholesterol-free.
Folate	Liver and organ meats, leafy vegetables, citrus fruit, whole grains, wheat germ, avocados
Vitamin B6	Poultry, pork, eggs, beans, legumes, whole grains, sunflower seeds
Vitamin B12	Liver, kidney, red meat, poultry, fish, eggs, soy powder, yeast extracts
Cruciferous	The cruciferous vegetables are so-named for their cross-shaped flowers. They include; cabbage, Brussels sprouts, broccoli, cauliflower, kale, kohlrabi, turnips, and watercress
Allium	Onions, spring onions, green onions, chives, shallots, garlic, leeks. The less the garlic is cooked the more effective it is. The distinctive garlic aroma is a good indication of its effectiveness.
Vitamin A IU	Vitamin A is found in animal sources such as; eggs, milk, cheese, cream, meat, liver, kidney, cod, halibut, fish oil. Beta carotene is found in plant sources such as carrots, pumpkin, sweet potatoes, butternut and other squash, broccoli, spinach, and most dark leafy vegetables. It is also found in spanspek, pink grapefruit, and apricots.

	YOUR RECOMMENDED INTAKE	SOURCE
Vitamin E IU		Wheat germ, corn, nuts, seeds, olives, spinach, asparagus, green leafy vegetables and vegetable oils (corn, sunflower, soybean, and cottonseed), and products made from vegetable oils such as margarine.
Vitamin C mg		Citrus fruit, kiwi fruit, strawberries, guavas, tomatoes, alfalfa sprouts, and green peppers. Antioxidants are also found in other sources such as berries, garlic and green tea.
Fruit and Vegetables		A portion of vegetables represents: 1 cup of raw, leafy vegetables OR 1/2 cup of other vegetables, cooked or raw OR 3/4 cup of vegetable juice. A portion of fruit constitutes: 1 medium apple, orange, banana, etc. OR 1/2 cup of chopped, cooked or canned fruit OR 3/4 cup of fresh fruit juice OR 1/4 cup of dried fruit
Calcium		Milk and foods made from milk are the richest dietary sources of calcium. Calcium is also found in dark green vegetables, nuts, canned salmon and sardines (if you eat the bones) and calcium-fortified foods and beverages.
Vitamin D		Fortified foods are the major dietary sources of vitamin D. The richest natural source is milk, followed by fish oils and fatty fish such as tuna, salmon, sardines, mackerel and herring.
Caffeine		Percolated, drip coffee has the highest concentration of caffeine (115 mg – 135 mg per cup) as the coffee grounds remain in contact with the water for a longer time. Some people believe they can cut their caffeine intake by drinking espresso, but due to the small volume, the actual caffeine content per milliliter in espresso is much higher than in a regular brew. Other common caffeine sources include; tea, which contains 40 – 60 mg, soft drinks 35 – 55 mg per 350ml, and chocolate 10-30 mg per 45 grams.
Refined CHO		Try to avoid foods containing large amounts of sugar and other refined simple carbohydrates, such as; biscuits, cakes and pastries, chocolate, ice cream, soft drinks and fruit cordials, sweets and snack bars, and jams. We also recommend you minimize foods containing refined complex carbohydrates such as; pizza, sugaryprocessed breakfast cereals, white bread, white flour, white pasta, and white rice.



SECTION 5. FAQS AND KEY TERMS

FREQUENTLY ASKED QUESTIONS



HOW CAN TESTING MY GENES CONTRIBUTE TO A BETTER DIET AND LIFESTYLE?

Your health is a result of interactions between your genes and lifestyle factors such as diet, exercise, stress, smoking and alcohol consumption. It is your genetic makeup that determines which nutrients are used and how they are used, the way toxins are removed and how effective these key processes are within the body. However, by adjusting your lifestyle, you can have a great impact on how your genes work and compensate for areas in which your genes are functioning at an altered level.

ARE THERE ANY ADDITIONAL BENEFITS TO DNA HEALTH THAT I WOULDN'T GET IF I JUST FOLLOWED A HEALTHY DIET PRESCRIBED BY A DIETITIAN?

Today, every pharmacy, health food shop, magazine and supermarket is stacked with dietary and nutrition advice, much of it sound and healthy. But how do you know which guidelines are relevant for you? Besides, the problem is not only the quality but the large amount of advice out there – In contrast, gene-based specific guidelines tailored to your particular needs – is much more realistic. Our experience shows that personal advice provides people with that extra bit of motivation for making a stronger commitment to healthy living.

WHAT KIND OF GENE TEST IS DNA HEALTH?

The test focuses only on gene variations that may call for changes in diet or lifestyle. By learning about the specific nature of some of your genes from your report, you will learn to focus on factors that could be of greatest benefit to your health. Our DNA analysis does not include genes that do not interact with your nutrition or lifestyle.

WILL THE TEST TELL ME IF I HAVE GENES FOR ANY SERIOUS INHERITED DISEASE?

No, our screening is not a test for inherited disorders or inherited predisposition to disease. We do not screen for disorders caused by a defect in a single gene, such as Huntington's disease, cystic fibrosis or sickle cell anemia. Nor do we test for inherited genes linked to a specific disease – for example, genes associated with certain forms of breast cancer that run in families. If you think you may carry the genes for an inherited disease, you should speak to your doctor.

DNA Health focuses on the presence of gene variations that influence a person's ability to derive maximal benefit from diet and lifestyle practices recommended by current medical research for preventing disease and maintaining well-being. While we cannot promise that if you take our advice you will never become ill, the test allows you to make informed choices about your diet and lifestyle that give you a better chance of staying well.

CAN DNA HEALTH TELL ME IF I AM ILL?

No, we can only determine what types of genes people have and how they relate to certain metabolic processes involved in well-being. That is why we ask you in the lifestyle questionnaire whether you are under medical supervision. If you think you may be ill, you should consult your doctor.

SECTION 5. FAQS AND KEY TERMS

FREQUENTLY ASKED QUESTIONS

IF I HAVE GENE VARIATIONS SHOULD I BE CONCERNED?

Most of the time, gene variations have no effect on our body systems or our health, and in certain cases these variations can even be beneficial. However, sometimes a variation can make the gene send a slightly altered message to the cell. Upon receiving the altered message, the cell will manufacture a product – such as an enzyme – that doesn't work exactly as it should; the variant enzyme may, for example, work faster or more slowly than is best for the body. Combined with an unhealthy diet or lifestyle, such a gene variation may make a person more susceptible to developing health problems. By following advice that takes into account the presence of genetic variations, you can increase your chances of maintaining or achieving good health.

WHO WILL HAVE ACCESS TO MY DNA RESULTS OR QUESTIONNAIRE?

No one. All of the personal information you choose to share with us (your DNA sample, your identifying details and personal health information) is kept strictly confidential. We are aware of the need for strong and appropriate privacy safeguards, and that is why we ensure that no one has access to your information without your prior consent. We de-identify the material you send us to make sure that your identity is separate from your information that undergoes evaluation. We do not sell information, nor do we disclose any details to third parties, such as insurance companies or medical aids. Your DNA is identifiable only by a barcode, so that even lab staff do not know to whom the sample belongs. When the analysis has been completed, the sample is physically destroyed. We do, however, keep your contact information separately in our databases for further communication with you.

DOES THE TEST LOOK AT MY COMPLETE GENOME?

The Human Genome Project, which involved an international network of research centers and took 13 years to complete, has accomplished a monumental task: deciphering the 3 billion “letters” of the human genetic code. Scientists are currently tackling the next frontier: understanding how these genes work and what functions they perform in the body. At present, deciphering a person's entire genome – would not be particularly useful. However, genetic science has already yielded sufficient knowledge to have an impact on our daily lives: an understanding of how gene variations affect the way our bodies process certain nutrients. What's unique about our service is that by analyzing these variations, it allows people to know enough about their genetic makeup to adopt a healthier lifestyle.

WHERE DO I GO IF I WANT MORE DIETARY ADVICE?

If you would like to receive further nutritional guidance after reading your personal report, you should consult a dietitian, a nutritionist or your doctor. This may be particularly valid if you have been diagnosed with a food intolerance, an allergy or any medical condition – or if you simply wish to continue learning about healthy eating and lifestyle habits. From March 2010 you will be able to find a dietician on our website (www.dnadiet.co.za) who has been accredited as a DNAlysis practitioner and who has received training in the field of nutrigenomics. If you have any additional nutritional queries concerning your personal report, please contact us at 011 268 0268 or email info@dnalysis.co.za

WHAT SHOULD I DO IF I HAVE QUESTIONS ABOUT MY RESULTS OR REQUIRE FURTHER INFORMATION?

If you have any questions regarding any aspect of our service, please call 011 268 0268 or email info@dnalysis.co.za

KEY TERMS EXPLAINED

AMINO ACID • The basic building block of proteins. Each protein consists of a different set of amino acids, put together according to instructions in the corresponding gene. There are 22 amino acids, each encoded by a three-letter “word” of the genetic code.

ANTIOXIDANT • Any compound that prevents or neutralizes the damaging effects of free radicals – reactive oxygen molecules in cells. Some natural antioxidants are produced in the body while others, such as certain vitamins and phytochemicals, are found in a variety of foods.

CARBOHYDRATES • Organic compounds that contain carbon, hydrogen and oxygen. They include simple sugars such as fructose and glucose, as well as the more complex saccharides such as lactose, starch and cellulose. Carbohydrates are an excellent source of energy.

CELL • The basic structural subunit of any living organism. It is a tiny, watery compartment filled with chemicals and it contains a complete copy of the organism’s genome. Some organisms are made up of only one or two cells, whereas the human body consists of billions. Each cell is enclosed by a membrane and in most cases has a nucleus containing genetic material (DNA) organized in the form of chromosomes.

CHROMOSOME • A tightly coiled microscopic structure made up mainly of DNA. Chromosomes are found in most cells of the human body, inside the nucleus.

CLONING • The process of making an identical copy of something. The term is used when making copies of a piece of DNA, usually a gene (molecular cloning), culturing cells (cell cloning) or making copies of a living organism (for example, animal cloning).

DETOXIFICATION • The process by which the body rids itself of unwanted and potentially harmful substances, or toxins. These toxins can come from food, water or air – or from the by-products of normal metabolism. Detoxification generally happens in the liver or kidneys, where toxins are either broken down or attached to a water-soluble natural chemical so they can be easily excreted in the urine or sweat.

DNA • The genetic material of living organisms, an abbreviation for deoxyribonucleic acid. The DNA is known as a “double helix” because its molecules have the shape of a twisted ladder consisting of two intertwined coils. DNA forms the genetic blueprint; it contains the genes that carry all the information about our appearance, about how our bodies function and sometimes about the diseases we will get. The building blocks of DNA contain four different chemicals – adenine, thymine, cytosine and guanine, or A, T, C and G for short – referred to as the “letters” of the genetic code.

ENZYME • A protein that carries out the biochemical reactions essential for the body to metabolize food and produce energy for growth, repair and movement. Organisms could not function if they had no enzymes.

FATS • Organic compounds composed of glycerol and fatty acids that serve as the most concentrated source of energy in foods. Depending on the predominant type of fatty acids they contain, they are divided into saturated and unsaturated molecules.

FREE RADICAL • An extremely active portion of an oxygen or other molecule formed in the body as part of normal metabolism. If produced in excess, or not neutralized efficiently, it releases an electric charge that can damage cell structures and proteins.

GENE • A segment of the DNA molecule that contains instructions for making a protein. The sequence of genetic “letters” (e.g., ATT CGG) in our genes determine how, when and where our bodies make each of the many thousands of proteins required for life.

GENE VARIATION • A naturally occurring variation in the DNA that is present in at least 1% of the population. The variation means an alteration in one or more letters of the genetic alphabet. For example, where most people have the genetic letter A, the person with the variation may have a T. Scientists call such variations “polymorphisms.” Most gene variations are harmless and are part of normal human genetic diversity.



GENETIC CODE • The instructions in a gene that tell the cell how to make a specific protein. A, T, C and G are the “letters” of the genetic code; they stand for the chemicals adenine, thymine, cytosine and guanine, which make up DNA. Each gene’s code combines the four chemicals in various ways, spelling out three-letter “words” that specify which amino acid is needed at every step in making a protein.

GENETIC DISEASE • Any disorder caused by defects in genes. Single-gene disorders, which are relatively rare, are caused by mutations in a single gene – for example, cystic fibrosis or sickle cell anemia. More common are complex, or multi-factorial, diseases, arising from variations in several genes together with environmental factors. Examples of complex diseases include most types of cancer, heart disease and diabetes.

GENETIC ENGINEERING • The use of various experimental techniques to produce DNA that contains new or modified genes or combinations of genes.

GENOME • The total genetic code of a particular organism. The normal human genome consists of about 3 billion genetic “letters.”

GENOMICS • A specialized branch of science that studies the genome.

GM FOODS • Genetically modified (GM) foods have been produced using genetic engineering to modify, insert or remove one or more genes from the genome.

METABOLISM • The natural process by which all living organisms, including humans, transform food into energy and dispose of their waste products.

MOLECULE • The smallest part of any compound or substance that is chemically stable. It consists of two or more atoms joined together by chemical bonding.

NUCLEUS • The central cell structure; it contains the chromosomes.

OXIDATIVE STRESS • A situation in which the environment within cells becomes highly “oxidized” – that is, comes to contain reactive, unstable molecules, particularly those of oxygen. These reactive molecules called free radicals can attach themselves to proteins and DNA inside the cell and cause damage. Oxidative stress has been linked to the development of disease.

POLYMORPHISM • Scientific term for “gene variation.”

PROTEINS • Complex organic compounds that contain carbon, hydrogen, oxygen and nitrogen. It is the presence of nitrogen that differentiates proteins from carbohydrates and fats. The basic building blocks of proteins are amino acids. Humans need 22 amino acids for the synthesis of their proteins. The human body can make only 13, known as nonessential amino acids because we don’t need to get them from the food we eat. There are nine essential amino acids that are not made by the body and can be obtained only from food.

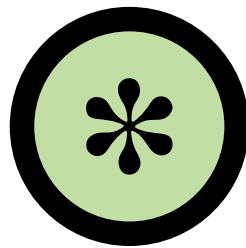
SNP • Single nucleotide polymorphism, pronounced “snip.” A gene variation that consists of alteration in a single genetic “letter,” or base: for example, GGT instead of GCT. Such common, though minute, variations occur in human DNA at a frequency of one in every 1,000 bases.

TOXIN • A harmful substance, specifically one produced by an animal, plant or bacterium. Toxins can enter the body from one of these sources or be generated as by-products of metabolism. Constant exposure to toxins can overwhelm the body’s detoxification mechanisms and lead to disease.

VITAMINS • Organic molecules essential for normal metabolism, growth and development, and for the regulation of cell function. Some vitamins activate specific enzymes in the body. Insufficient vitamins in the diet lead to deficiency.

WHERE TO NOW?

Now that you have identified the optimal diet and lifestyle for you, you will have identified if achieving and maintaining a healthy body weight requires your attention. If so DNA DIET will continue your commitment to good health.



dnadiet
optimal weight for life

THE SCIENCE OF MANAGING WEIGHT AND OBESITY

DNA Diet was designed to optimise weight loss and weight management by guiding the planning of a diet and exercise programme based on genetic differences in metabolism, fat loss and dietary fat absorption. DNA Diet is one of the first products of its kind in the world, and recent clinical trials have shown that genetics-based weight-management programmes significantly outperform traditional weight-management programmes.

DNA Diet tests 8 genes that govern weight loss and weight maintenance, the results of which provide the clinical foundations upon which to make individual recommendations to achieve:

- optimal weight loss and weight management
- optimal dietary modification
- optimal lifestyle improvements such as the type and amount of exercise required.

Visit www.dnadiet.co.za for more information.

