PATHWAY OME
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CLIA # 05D1092505 - CAP 7232232

DIET, NUTRITION & EXERCISE

YOUR PERSONAL GENETIC REPORT

Nutrition iQ

Protected Health Information

Nutrition iQ

AMENDED REPORT JUN 15, 2018

POWERED BY PATHWAY GENOMICS

ACCESSION NUMBER	: **I4220474**	NAME/ID	: **SportTestTwo Tester**
ACTIVATION CODE	: **PGTST-SPORT**	DOB	: **Mar 3, 1943**
SPECIMEN TYPE	: **Buccal Swab**	SEX	: **M**
COLLECTED DATE	: **Jun 7, 2018**	ETHNICITY	: **Caucasian**
RECEIVED DATE	: **Jun 15, 2018**	LABORATORY DIRECTOR	: **Nilesh Dharajiya, M.D.**
REPORT DATE	: **Jun 15, 2018**		

DIET & EATING BEHAVIORS

CONDITIONS/TRAITS	RESULTS
Matching Diet Type	: Balanced Diet
Snacking	: Increased
Satiety-Feeling Full	: Typical
Sweet Tooth	: Typical
Eating Disinhibition	: Less Likely
Food Desire	: Typical
Hunger	: Typical

NUTRIENTS

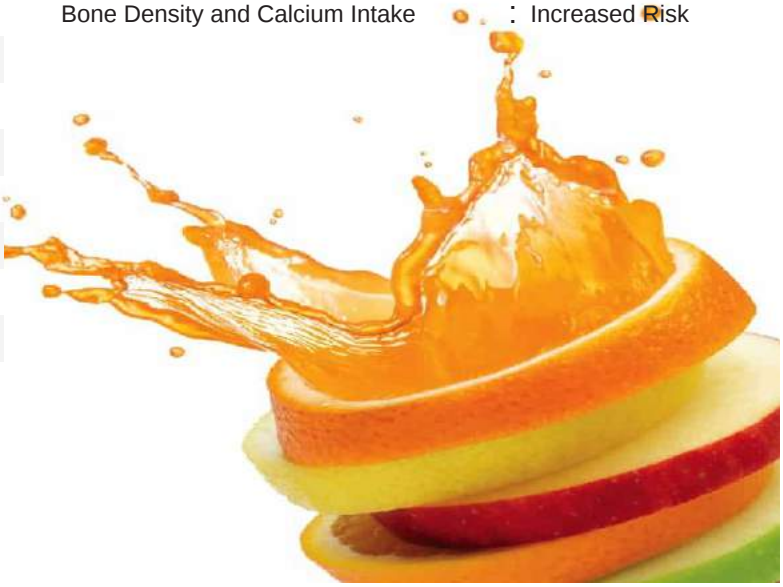
CONDITIONS/TRAITS	RESULTS
Vitamin B6	: Optimize Intake
Vitamin B12	: Optimize Intake
Vitamin E	: Optimize Intake
Vitamin C	: Stay Balanced
Vitamin D	: Stay Balanced
Folate-Folic Acid	: Stay Balanced
Vitamin B2	: Stay Balanced
Vitamin A	: Stay Balanced
Omega-6 and Omega-3 Levels	: Typical

FOOD REACTIONS

CONDITIONS/TRAITS	RESULTS
Caffeine Metabolism	: Slow Metabolizer
Lactose Intolerance	: More Likely
Sweet Taste	: Decreased
Response to Polyunsaturated Fats	: Increased Benefit
Alcohol Flush	: Less Likely
Bitter Taste	: Inconclusive
Gluten Sensitivity (Celiac)	: Low Risk
Response to Monounsaturated Fats	: Neutral

EXERCISE & FITNESS

CONDITIONS/TRAITS	RESULTS
Bone Density and Calcium Intake	: Increased Risk



DIET & EATING BEHAVIORS

MATCHING DIET TYPE

YOUR RESULT
BALANCED DIET

I should eat a variety of fruits, vegetables, whole grains, lean proteins and healthy fat. I should avoid processed foods, trans fats and added sugars.

Your diet has been selected by looking at many genetic variants associated with how people respond to the different macronutrients (proteins, fats and carbohydrates) in their food. Your genetic risk profiles for metabolic health factors were also evaluated to determine your recommended diet. Together, your genetic results suggest which one of the following diets may be best for you: "Low Fat," "Low Carb," "Mediterranean" or a "Balanced Diet." It is highly recommended to discuss any change in your diet plan with your health care provider.

55% CARBS
25% FATS
20% PROTEIN

SNACKING

YOUR RESULT
INCREASED

I am more likely to snack. Snacking can be a healthy or unhealthy behavior, depending on my food choices.

Snacking can be a healthy or unhealthy behavior. Snacking on balanced foods, containing healthy fats, lean protein, fiber and low glycemic index carbohydrates, in small portions, throughout the day can help control hunger cravings and reduce total caloric intake, while snacking on junk food can have negative health effects. Genetic markers associated with snacking behavior include variants in the receptor for leptin, an essential hormone for the regulation of food intake. The possible results in this report are "Typical" and "Increased." If you receive the "Increased" result, you may want to curtail the negative effects of snacking by choosing healthy snacks, eating slowly and reducing the size or calories of snacks. People with the G/G genotype in a leptin receptor (LEPR) genetic marker were more likely to show "Increased" snacking behavior. "Typical" genotypes were not associated with "Increased" snacking behavior in the same study. This association has not been studied in men.

SATIETY-FEELING FULL

YOUR RESULT
TYPICAL

I may have no difficulty feeling full after meals.

Satiety can be described as the feeling of fullness after you eat. The FTO (fat mass and obesity-associated) gene is known to be an important factor that predisposes a person to a healthy or unhealthy level of body weight. The two possible outcomes in this report are "Difficulty in Feeling Full" and "Typical." People who experience "Difficulty in Feeling Full" tend to eat more without feeling satisfied. To help manage this outcome, you could increase the amount of fiber in your diet and balance meals and snacks throughout the day. Examples of foods high in fiber include whole wheat bread, oatmeal, barley, lentils, black beans, artichokes, raspberries, and peas. In a 2008 study, the A/A genotype at rs9939609 in the FTO gene was associated with "Difficulty in Feeling Full". Although this study was done in children, there is preliminary data to support that the association also holds true in adults.

SWEET TOOTH

YOUR RESULT
TYPICAL

My genes are associated with an average intake of sugary foods.

Craving sweet foods is sometimes described as having a "sweet tooth." The possible outcomes in this report are "Increased" or "Typical." If your genotype shows an "Increased" likelihood to eat lots of sweets, try choosing fruit as a healthy sweet alternative to sugary foods or soda. Be sure to follow your diet as some diet plans, such as the low carbohydrate diets, significantly limit the amount of sugar you can eat. Sweet foods can include healthy foods, such as fruits, or unhealthy foods like candy and sweetened beverages. People with the C/T and T/T genotypes showed an "Increased" likelihood to eat more sweets and sugary foods, while people with the C/C genotype were more likely to have a "Typical" intake of sugary foods.

FOLATE-FOLIC ACID

YOUR RESULT
STAY BALANCED

My genes are not associated with folate-folic acid deficiency. I should maintain an overall healthy diet.

Folate is found in many foods, such as green leafy vegetables like chard or kale, as well as beans, lentils, fruits and fortified grains. This nutrient plays a role in protein metabolism, as well as DNA repair. Folate can lower the blood level of homocysteine, a substance linked to cardiovascular disease at high levels. Diets rich in folate have been associated with reduced risk of cardiovascular disease. Folate is particularly important early in pregnancy for preventing some birth defects. For this reason, pregnant women or women intending to become pregnant are advised an elevated recommended daily intake of 600 micrograms of folate. The recommended intake of folate for most adults is 400 micrograms per day. A relatively common variant in the MTHFR gene, known as C677T (rs1801133), has been associated with lowered folate and elevated homocysteine levels in the blood. Hence, people with a T/T or C/T genotype should "Optimize Intake" of folate. People with the C/C genotype should "Stay Balanced" and maintain a healthy diet. The studies we report observed associations between vitamin levels and particular genotypes; however, that does not mean that your levels are out of balance. You should ensure that you are eating a healthy diet and discuss this result with your physician.

VITAMIN B2

YOUR RESULT
STAY BALANCED

My genes are not associated with Vitamin B2 deficiency. I should maintain an overall healthy diet.

Vitamin B2, or riboflavin, is a central component of flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD), both of which serve as cofactors of several critical enzymes involved in the electron transport chain, as well as in the metabolism of carbohydrates, fats and proteins. Vitamin B2 is found in a variety of foods including milk, cheese, green leafy vegetables, legumes, beans, lean meats and fortified grains. Individuals with the T/T genotype at a variant in the MTHFR gene are likely to have increased levels of homocysteine, which are a risk factor for cardiovascular disease and stroke. Levels of homocysteine were highest in T/T individuals with low riboflavin or vitamin B2 levels, and further, riboflavin supplementation was found to reduce homocysteine levels in these individuals. Thus, individuals with the T/T genotype should "Optimize Intake" of vitamin B2 by eating foods rich in vitamin B2. On the other hand, vitamin B2 levels are likely to have a relatively small impact on homocysteine levels in people with the C/T or C/C genotypes, and hence, they should "Stay Balanced" and maintain a healthy diet.

VITAMIN A

YOUR RESULT
STAY BALANCED

My genes are not associated with vitamin A deficiency. I should maintain an overall healthy diet.

Vitamin A is a nutrient that describes a number of related compounds, including retinol, retinal, and retinoic acid. Vitamin A is critical for numerous functions in the body, including healthy vision, immune system action, bone growth, reproduction, and the proper regulation of gene expression. The recommended intake of vitamin A for most adults is 700 to 900 micrograms per day. Much of the vitamin A found in your body is derived from beta-carotene, a nutrient found in some plants and foods, such as pumpkin, carrots, sweet potatoes and spinach. A genetic study has found that vitamin A conversion from beta-carotene is impaired in women carrying variants of the BCMO1 gene. This association has not been studied in men. Those with a result of "Optimize Intake" may bypass this effect by consuming adequate amounts of preformed vitamin A, which can be found in fortified milk and breakfast cereals, as well as in multivitamins containing retinyl palmitate or retinyl acetate. People who receive a "Stay Balanced" outcome should maintain a healthy diet. An additional outcome in this report is "Inconclusive," which means that there was not enough scientific evidence to determine how your genotype relates to the efficiency of converting beta-carotene to vitamin A. The study we report observed associations between vitamin A levels and particular genotypes. However, that does not mean that your levels are out of balance. You should eat a healthy diet and speak with your physician before making specific changes to your dietary regimen.

FOOD REACTIONS

CAFFEINE METABOLISM

YOUR RESULT
SLOW METABOLIZER

Caffeine is more likely to move through my metabolism at a slower rate, so it may have a longer lasting effect on me.

Caffeine is one of the most widely consumed stimulants in the world, and it is found in the leaves and seeds of many plants. It is also produced artificially and added to some foods. Caffeine is found in tea, coffee, chocolate, many soft drinks and energy drinks, as well as in some pain relievers and other over-the-counter medications. Caffeine is metabolized by a liver enzyme, which is encoded by the CYP1A2 gene. Variation at a marker in the CYP1A2 gene results in different levels of enzyme activity, and thus, different metabolism rates for caffeine. Therefore, the two possible genetic results in this report are “Fast Metabolizer” and “Slow Metabolizer." If you are a "Slow Metabolizer," then caffeine may have longer lasting stimulant effects for you. In addition to genetics, your body’s ability to metabolize caffeine also depends on other lifestyle factors. For example, how much coffee you drink, whether you smoke or whether you take hormonal birth control, may also affect your ability to metabolize caffeine. Because these and other lifestyle factors may both increase or decrease your caffeine metabolism, the most sensible advice is to make lifestyle choices that have the maximum benefit for your overall health.

LACTOSE INTOLERANCE

YOUR RESULT
MORE LIKELY

I have an increased genetic likelihood for lactose intolerance, and may experience uncomfortable side effects from eating lactose.

Lactose intolerance is the inability to digest lactose, the sugar found in milk and milk products. This condition is caused by the lack of an enzyme called lactase. The rs4988235 variant lies close to the lactase (LCT) gene, in the MCM6 gene, and has been shown to regulate lactase levels. If you are lactose intolerant you should make sure that you are getting enough calcium from non-dairy or lactose-free sources. On the other hand, if you are not lactose intolerant, be aware that dairy products can be high in calories, fat, or both. You need to watch your intake accordingly or select low fat dairy products. People with a C/C genotype at rs4988235 are "More Likely" to be lactose intolerant, while people with other genotypes are "Less Likely". This variant has been found to be associated with lactose intolerance in Caucasians, while other variants might play an important role in other ethnicities, including Africans and Asians.

SWEET TASTE

YOUR RESULT
DECREASED

I may prefer foods with more sugar since I am less likely to taste sweetness in foods that are low in sugar. I should keep healthy options available, such as fruit.

Sweet is one of the most basic tastes we can experience and is usually found in sugar and sugary foods. The sensation of sweet taste is triggered to the brain from the taste buds. There are receptors on your tongue that are programmed by your genes to determine how you taste sweetness. A 2009 study showed that genetic variants found in the sweet taste receptors can result in "Typical" or "Decreased" sensitivity to the sweet taste of sugar. People with "Decreased" sensitivity may prefer foods with more sugar since they are less likely to taste sweetness in foods that are low sugar.

RESPONSE TO POLYUNSATURATED FATS

YOUR RESULT
INCREASED BENEFIT

Including polyunsaturated fats in my diet will help me better maintain a lower body weight.

Polyunsaturated fat is considered a healthy fat and is important for heart and brain function, as well as growth and development. Two types of polyunsaturated fats are omega-6 and omega-3 fats. Good sources of omega-6 fats include evening primrose and borage oils, as well as olives, nuts and poultry. Additionally, good sources of omega-3 fats include fish and seafood, as well as flaxseed, walnuts, hemp seeds, and dark green leafy vegetables. The two possible outcomes in this report are "Increased Benefit" or "Neutral." Having an "Increased Benefit" from polyunsaturated fat means you should try to eat foods containing polyunsaturated fats. In general, it is best to avoid trans fats and minimize saturated fats. One study in women has shown that those with a certain genetic variant in the PPARG gene tend to have a lower body weight when they consume more polyunsaturated fats than saturated fats. This association has not been studied in men.

ALCOHOL FLUSH

YOUR RESULT
LESS LIKELY

I am less likely to experience a reaction after drinking even small amounts of alcohol.

Drinking alcoholic beverages is a relaxing or social activity for many, but for some it is exceedingly unpleasant due to their body's adverse reaction to alcohol. One such reaction is called alcohol flush, in which drinking even small amounts of alcohol causes a person's face to flush red and in some cases feel warm and itchy. People who flush may also experience other unpleasant symptoms, such as rapid heartbeat, nausea, or dizziness in response to alcohol. Alcohol flush is largely attributed to genetic variation in the ALDH2 gene, which encodes an enzyme critical for proper alcohol metabolism. Those who carry the inactive version of this gene are much "More Likely" to flush and experience other negative responses to alcohol, while people with other genotypes are "Less Likely" to flush. Perhaps not surprisingly, this variant is also associated with overall reduced consumption of alcohol. In most cases, avoiding alcohol is the best remedy for those who experience alcohol flush.

BITTER TASTE

YOUR RESULT
INCONCLUSIVE

There is not enough scientific evidence for how my genes are associated with bitter taste sensitivity.

People taste things differently. Variations in the TAS2R38 gene are associated with different levels of sensitivity to a chemical called PTC, which produces a strong bitter taste. The possible results for bitter taste are "Taster," "Non-Taster," or "Inconclusive." A person described as a "Taster" may be more sensitive to bitter flavors found in foods, such as grapefruit, coffee, dark chocolate and cruciferous vegetables, such as Brussels sprouts, cabbage and kale. Being a "Taster" does not mean you do not enjoy these foods, but you may sense a stronger bitter taste compared to a "Non-Taster." In addition, tasters may need to watch their salt intake, because they may have an increased preference for salty foods, which mask the bitterness. A genetic result of "Inconclusive" means that there is not enough scientific evidence for how your genotype is associated with bitter taste sensitivity.

EXERCISE & FITNESS

BONE DENSITY AND CALCIUM INTAKE

YOUR RESULT
INCREASED RISK

Your genotype is associated with an increased likelihood of low bone density.

Osteoporosis is a metabolic bone disease characterized by low bone mass and bone tissue deterioration, which leads to increased risk of osteoporotic fracture. Studies have demonstrated that osteoporosis involves both genetic and environmental factors with contributions of 70% to 30%, respectively. Genetic variants have been shown to correlate to osteoporosis and/or low bone mineral density and are characterized by three classification levels based on the individuals specific genotype, "Average Risk" or "Increased Risk" of low bone density. This classification can be used to assist individuals in understanding their potential risk of low calcium uptake, bone density issues and to assess appropriate measures for managing calcium uptake and preventing bone damage and fractures.