IDLife

DNA

NUTRITION + FITNESS SIMPLIFIED

WELCOME

The Molecular Genetic Panel for Optimal Health & Fitness

Hello,

We want to welcome you to the exciting new technology of molecular genetics and congratulate you for obtaining your Molecular Testing Labs Fitness+Nutrition DNA tests. The information contained in this report reflects your individual genetic make-up and will provide valuable guidance on how to most effectively and efficiently optimize your diet, supplements, and exercise program. This information empowers you to make choices to receive the most benefit for the effort and resources you commit to protect your health and keep your body fit. It will give you advice and guidance to ensure your efforts are being maximized.

It is important to note that your health and fitness are dependent on many factors. Your genes, environmental influences, and lifestyle choices all contribute to the current state of your body and health. Your health and the way your body responds to nutrition and various types of activity are multifactorial. It has been shown that genetics contributes approximately 30-40% to your body's responses to food and activity, including exercise. Many of the various genes that contribute to this have been analyzed for this report. There are, however, still strong influences from habits, training, ethnic customs, availability of certain foods over time, influences of friends and family, mental impact from the media, and your current health status. Furthermore, any one gene at most contributes no more than a few percent influence to the variability found between individuals when it comes to health and fitness.

Let this report be a guide to help you identify and implement actions to assist you in taking control of your health and fitness. The usefulness and effectiveness of what you learn here may be multiplied many times over by bringing this information to your trainer, your healthcare provider, your nutritionist and any other advisor you trust. Receive the greatest benefit from this report by leveraging the information contained here with the professional input of such counselors, trainers, and healthcare providers who have the knowledge and training to fully interpret and implement the results of molecular genetic testing.

Again, congratulations on caring enough about your body and health to obtain the results of your Fitness+Nutrition DNA panel. Let us know how this report impacts your health and let us know how we can continue to improve our testing and help you manage these important aspects of your life.

Charles J. Sailey, MD, MS, FCAP, FASCP
Laboratory Medical Director
Molecular Testing Labs

TABLE OF CONTENTS

SUMMARY OF RESULTS

This Nutrition & Fitness Genetics Report is your personalized owner's manual on how your body responds to diet and exercise based on your unique genetic profile. By following the recommendations found in this report, and working with your body instead of against it, you will better be able to maximize the results you see from your diet and lifestyle choices, helping you achieve the results you've always dreamed of.

INFLAMMATION *(page 24)*

INCREASED RISK
Eat cold water fatty fish, such as salmon, albacore tuna, and lake trout twice a week, consider an omega-3 supplement, and limit intake of sugar and fried foods.

VITAMINS

VITAMIN A *(page 28)*

Standard requirements

VITAMIN D *(page 29)*

Normal levels expected in your body

VITAMIN E *(page 30)*

Standard requirements

VITAMIN B6 *(page 31)*

Increased requirements

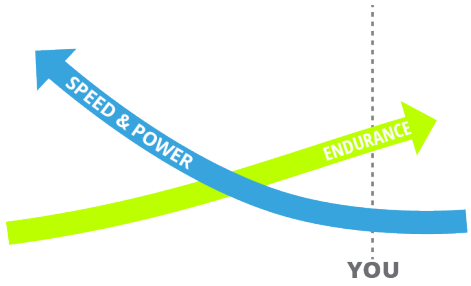
FOLATE *(page 32)*

Slightly increased requirements

VITAMIN B12 *(page 33)*

Increased requirements

MUSCLE PERFORMANCE *(page 9)*



ENDURANCE
You may need to increase intensity and change up your routine for max calorie burn. Boost performance and metabolism by cross training, high-volume training, and high-intensity interval training.

FAT LOSS WITH EXERCISE *(page 10)*

LEAST EFFICIENT
You will need to add burst of cardio to your strength training regimes, along with closer monitoring of your diet. Try doing air squats or jumping rope between resistance sets.

AEROBIC POTENTIAL *(page 11)*

MEDIUM
Improve your endurance and receive maximum cardiovascular benefits with high-intensity and long interval training.

INJURY *(page 12)*

MODERATE RISK OF INJURY
Reduce risk of injury, including Achilles tendinopathy, by replacing training shoes before they are worn out.

RECOVERY *(page 13)*

MEDIUM RECOVERY
Minimize muscle soreness by preconditioning, warming up, stretching, and using a foam roller.

BODY WEIGHT *(page 18)*

NORMAL SUSCEPTIBILITY TO OBESITY
Exercising more rigorously will reduce your appetite more than exercising moderately or gently. Add bursts of higher intensity by jumping rope, training on incline, or power walking up hill.

WEIGHT REGAIN *(page 19)*

MODERATE RISK OF REBOUND WEIGHT GAIN
Eat small frequent meals and avoid very low calorie restriction diets because your body is likely to go into "starvation mode" and lower its metabolic rate.

APPETITE *(page 20)*

NORMAL RISK OF OVEREATING
Getting enough sleep, reducing stress, being active and staying hydrated will increase levels of appetite suppressing hormones and reduce the tendency to overeat.

IMPULSIVE EATING *(page 21)*

NORMAL RISK OF IMPULSIVE TENDENCIES AND ADDICTIVE BEHAVIORS
Genetics do not increase your risk; however, you are still susceptible to other factors including stress.

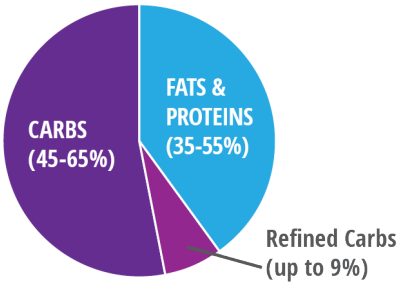
BITTER TASTE *(page 22)*

MODERATELY TOLERANT OF BITTERNESS IN FOODS AND ALCOHOL
Use lemons, limes, herbs, and spices in place of salt and sugar to mask bitter flavors in healthy vegetables.

CHOLESTEROL *(page 23)*

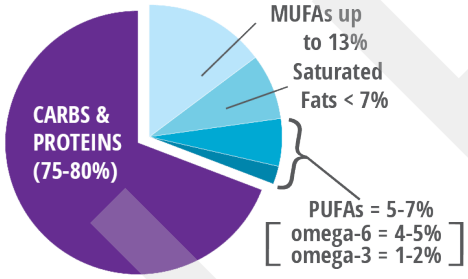
LOWER YOUR LDL (BAD) CHOLESTEROL:
Eat more fish or fish oil and limit dairy, animal fats, and processed foods.
INCREASE YOUR HDL (GOOD) CHOLESTEROL:
Limit sugar, corn syrup, white bread, and other refined carbs.

DIETARY CARBOHYDRATES *(page 14)*



MEDIUM SENSITIVITY
Limit sugar and refined carbs. Eat more foods with a low glycemic index (GI) to achieve your glycemic load target.

DIETARY FATS *(page 16)*



HIGH SENSITIVITY
Limit cheese, animal fats and butter; eat more avocados, nuts, nut butter, and olive oil.

LACTOSE *(page 25)*

LACTOSE INTOLERANT
Avoid or limit dairy containing more than 2% lactose to reduce gas, bloating, and other symptoms of lactose intolerance.

CAFFEINE *(page 26)*

LOW SENSITIVITY
Reduced stimulating effects may result in excessive consumption – limit to no more than 400 mg of caffeine (4 cups of coffee) per day.

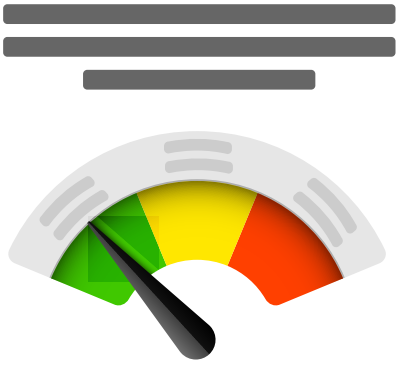
ALCOHOL *(page 27)*

NORMAL RISK OF ALCOHOL FLUSH
Adhere to standard guidelines for alcohol consumption.

HOW TO USE THIS REPORT

This is the basic layout of the individual result pages. Each page is broken into four sections: a section discussing the topic, a brief summary of the results, personalized guidance, and the genetic markers we look at to make our recommendations.

Get a quick summary of your results and the other possible outcomes in the top-left of the page.



Your unique actionable items will always appear in the blue "YOUR PERSONALIZED GUIDANCE" section.

Learn more about your genetics with the orange "THE GENES WE TESTED" section.

The Sprint Gene – ACTN3

The ***ACTN3*** gene codes for alpha-actinin-3, a protein found exclusively in fast twitch (type 2) muscle fibers. This is the type of muscle fiber used to generate explosive movements required for speed and power activities. Although this type of muscle fiber is capable of generating more force at a high velocity, it is more susceptible to fatigue. A shift towards more efficient oxidative metabolism may underlie a selective advantage imparted by a polymorphism that turns the ***ACTN3*** gene off. Although this genetic change has no serious direct health effects, it is detrimental to sprint performance but can enable better muscular endurance.

Power	Mix	Endurance
Hurdling	Football	Triathlon
Karate	Basketball	Cross country skiing
Gymnastics	Tennis	Cycling
Wrestling	Dancing	Mountain climbing
Baseball	Rowing	Hiking
Sprinting	Soccer	Distance running
Olympic lifting	Lacrosse	Distance swimming

YOUR PERSONALIZED GUIDANCE

Boost performance and metabolism with high-volume training and high-intensity interval training.

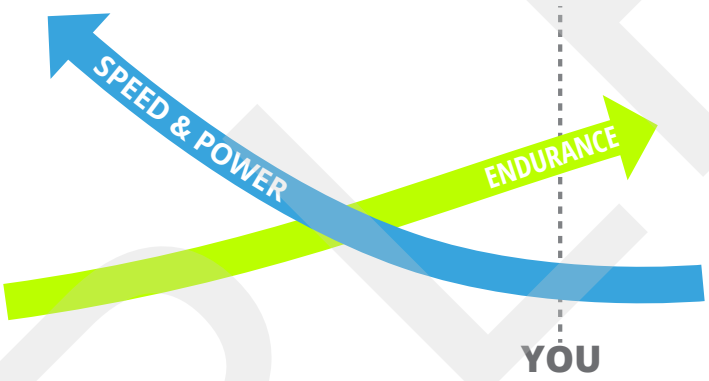
You have a polymorphism in the ***ACTN3*** gene that results in a loss of alpha-actinin-3. This is associated with decreased muscle mass and fiber diameter, slower contractile properties, increased fatigue resistance and an increase in oxidative enzyme activity. The shift towards more efficient muscle metabolism could likely result in better endurance.

You may not be able to jump as high as someone with the alternate genotype, but you can keep jumping for a longer time with less fatigue.

Strength/resistance training is critical for your genotype to increase muscle mass and burn fat. Power training is not strength training, but your relatively lower power potential can be improved by increasing your strength with appropriate training.

Because you lack a protein associated with a boost in muscle strength and performance, you may need to ramp it up for increased calorie burn.

Good for Endurance



THE GENE WE TESTED

Sprinter ***ACTN3*** **CC** Frequency in Population - **40.0%**

Two functional copies – commonly found in elite level sprinters and some endurance athletes.

Mixed ***ACTN3*** **CT** Frequency in Population - **45.1%**

One functional copy – commonly found in elite level sprinters and endurance athletes.

Endurance ***ACTN3*** **TT** Frequency in Population - **14.9%**

Alpha-actinin-3 deficient (zero functional copies) – found in many world class endurance athletes; almost never found in elite level sprinters or power athletes.

FAT LOSS WITH EXERCISE

INCREASE EXERCISE AND MONITOR DIET

Body Fat and Training

Ever wonder why some people get results with seemingly minimal effort while others have to train harder and longer to achieve the same goals?

As a result of genetics, some people will experience greater benefits with certain types of exercises. These genetic variants affect how fat is transported in the blood and where fat is stored for muscles to use as energy.

Because weight loss may be more challenging, a combination of cardio and strength training along with dietary control is likely to be the most effective.

YOUR PERSONALIZED GUIDANCE

You may have to exercise more intensely and for longer periods to lose weight. A combination of cardio and strength training along with dietary control is likely to be the most effective for weight loss.

Studies have shown that your genetic profile is associated with an increased risk for obesity which can be diminished with increasing the intensity of physical activities. Regular walking, taking the stairs, bicycling and similar actions can be an effective start at controlling this risk. Increasing to more active training and workouts will further increase the beneficial effects.

Include the frequency of resistance training to 2-3 times per week to most effectively improve strength, balance, coordination, and mobility. Resistance training will also help build bone and maintain bone density as you age.

THE GENES WE TESTED

The ***INSIG2*** gene is involved in energy metabolism and has been associated with resistance training induced changes in subcutaneous fat and muscle mass.

Certain variants on the ***FTO*** gene can make it challenging to lose weight. These variants are associated with an increased body fat percentage and a larger waist circumference but are more responsive to some types of exercise and training than to others.

AEROBIC POTENTIAL

AVERAGE ABILITY TO HANDLE METABOLIC STRESS

Aerobic Potential and VO2 MAX

As the intensity of your exercise increases, so does oxygen consumption. The point at which oxygen consumption plateaus defines your VO2 max. This is your maximal aerobic capacity and is generally considered an individual's best indicator of cardiorespiratory endurance and aerobic fitness. It has been shown that certain genetic markers are linked to your maximal aerobic potential.

YOUR PERSONALIZED GUIDANCE

High-intensity and long interval training are an effective way to improve endurance, maximize your potential and receive the greatest cardiovascular benefits.

In the following workout, we are focusing on full body movements for maximum calorie burn using high-intensity interval training (H.I.I.T.)..

H.I.I.T for 28 minutes
Three rounds of 45 seconds work and 15 seconds rest

- *Pushups*
- *Bodyweight squats*
- *Jab left/jab right*
- *Jumping jacks*
- *Running in place*
- *Leg raises*
- *Sit-ups*

Long interval training workouts include working intervals of one minute or longer, with one minute of rest between intervals.

Do one of the following exercises as hard as you can for one minute, rest for one minute, and repeat for a total of 30 minutes.

- *Sprint on the treadmill*
- *Uphill sprint on the spin bike*
- *50-yard sprints in the pool*
- *Running stairs*
- *Row machine*

Interval training with gradually increasing intensity, length, and number of rounds will improve your endurance and aerobic fitness.

THE GENES WE TESTED

The ***PPARGC1A*** gene codes for a protein that is linked to the ability of the muscles to respond to physical stimuli. This is accomplished by increasing the ability to handle oxidative stress thus increasing aerobic metabolism.

The ***PPARD*** gene affects the shift between lipid and glucose metabolism. When paired with wild type ***PPARGC1A*** CC genotype, ***PPARG*** has a strong correlation with elite level endurance athletes (odds ratio 8.2). With this genotype configuration, you are more likely to achieve your optimal endurance performance with less intense training-induced increases in maximal oxygen uptake and maximal workload.

Achilles Tendinopathy

The Achilles tendon is the largest tendon in the body. It connects your calf muscle to your heel bone and is used when you flex your foot which occurs when you run, walk or jump. Achilles tendinopathy is caused by inflammation as a result of repeated micro-tears. Anyone who plays sports or puts tension on the Achilles tendon is at risk for tendinopathy, especially those with a high-arched foot. Overuse leads to pain, stiffness, swelling, and weakness in the tendon. As with most tendons, the Achilles tendon has a limited blood supply and injuries can take months to recover.

Adhere to your personalized guidance for the prevention of tendon and soft tissue injuries.

YOUR PERSONALIZED GUIDANCE

Replace your shoes before they are worn out. Good arch support and good quality footwear help distribute the stress on the Achilles tendon.

Warm up and stretch your calf and hamstring muscles before to training and throughout the day. Poor flexibility with tight or underdeveloped hamstrings places increased focal stress on the Achilles tendons.

Activities that place extra stress on the Achilles tendon and further raise your risk for tendinopathy include jumping as might occur in basketball, tennis and volleyball, running downhill or any training on hard or sloped surfaces.

In the event of injury or overstress on the Achilles tendon, treat the area with ice packs for 10-30 minutes.

THE GENE WE TESTED

The ***MMP3*** gene codes for a protein that is involved in degrading cartilage and similar tissues during wound repair. Variations of this gene impact one's risk of Achilles tendinopathy and may also play a role in other types of tendon and ligament injuries. If you inherited two copies of the (C) version, your risk for suffering from Achilles tendinopathy is 2-3 times higher compared to those with two copies of the (T) version.

Delayed Onset Muscle Soreness

Delayed onset muscle soreness (DOMS) occurs 12-72 hours after you start a new exercise or increase the intensity, resistance, frequency or duration of your workout. It is important to manage DOMS to receive maximum benefit from your training and minimize fatigue and risk of injury. This soreness is different than muscle pain from an injury which develops during or right after an exercise. Training sore muscles does not impede recovery. If done properly, training can speed up recovery from DOMS by shuttling blood to recovering muscle tissue.

THE GENE WE TESTED

Substitutions on the *SLC30A8* gene are associated with the level of susceptibility to DOMS and also with the body's zinc stores and glucose and insulin levels. The alternate (T) version of this gene offers some protection against DOMS.

You have moderate susceptibility to delayed onset muscle soreness.

Follow standard recommendations to speed recovery and minimize soreness, including preconditioning, active rest, regular stretching, and use of a foam roller to lengthen muscles and break up knots.

KNOW THE DIFFERENCE BETWEEN SORENESS AND PAIN DUE TO INJURY	
Soreness	**Pain**
Tired or burning feeling during exercise and dull ache or tightness at rest	Sharp pain at rest or during exercise
Worsens with sitting still	Worsens with continued activity
Slight discomfort at routine everyday activities	Everyday activity is disturbed due to excessive discomfort or pain
Felt in muscles	Felt in muscles or joints
Felt most intense 1-2 days after exercise, subsides after 2-3 days	Pain starts during exercise or up until a day after and may persist if left untreated
Improves with stretching and active rest	Improves with rest and applying ice to affected area

YOUR PERSONALIZED GUIDANCE

As a result of genetics, you are less susceptible to DOMS than most individuals. You are still likely to experience a moderate amount of soreness. This is especially true if you are just starting to train and after increasing the intensity and resistance of your workouts.

The *repeated bout effect* is very effective in minimizing or preventing DOMS. This is an adaptation whereby a single bout of exercise protects against muscle damage from subsequent bouts of activity by preconditioning muscles, even weeks in advance. It can begin by utilizing low weights or even just your body weight.

Regularly stretch and use a foam roller to lengthen muscles and break up knots.

Take *active rest* after hard workouts. Low intensity cardio will reduce lactate levels, improve aerobic capacity and speed up recovery.

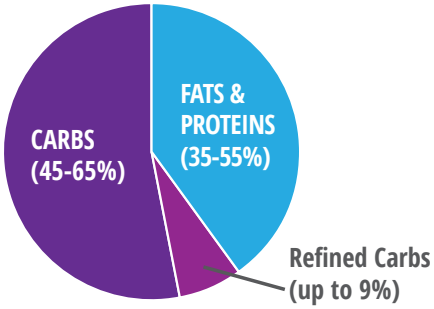
Other methods to deal with DOMS include avoiding training in high heat environments, staying hydrated, acupuncture, varying workout activities, and the use of topical astringents and dietary supplements containing branched-chain amino acids, glutamine, caffeine, turmeric, and antioxidants.

Importance of Carbohydrate Response

Carbohydrate sensitivity is a measure of how detrimental blood sugar fluctuations are for you. Sugar and other refined carbohydrates trigger weight gain, inflammation, and blood sugar imbalances; the impact is greater in individuals with high carbohydrate sensitivity. For some individuals, this can lead to insulin resistance and ultimately type 2 diabetes. To reduce your risk, choose quality carbs, and eat them throughout the day. These *good* carbs have a low **glycemic index (GI)**, are digested and absorbed more slowly than simple sugars and refined carbs, and produce a slower and more sustained rise in blood sugar.

For you, it's not about eating low carb. Eat better quality carbs such as more beans and less corn syrup.

Your daily carbohydrate requirements



Your glycemic load target - based on caloric requirement

Calorie/Day Diet*	Glycemic Load Target
1200	90
1600	120
2000	150

*****Calories/day is based on body weight and activity level*

Determine your recommended daily GL here, then use **Glycemic Load Chart found in Appendix A** to calculate and plan your carbohydrate intake.

YOUR PERSONALIZED GUIDANCE

Choose foods with a **low glycemic index (GI < 55)** spread throughout the day, to achieve your daily glycemic load (GL) target.

Limit added sugar to no more than 25 grams (100 Calories) daily. This includes sugar in corn syrup, cane juice, fructose, honey, and agave.

Limit other refined carbohydrates. This includes most bread, all flours, white rice, instant rice, instant oatmeal (anything labeled instant) and any ingredient with the word starch in the name such as corn starch.

Include more beans and non-starchy vegetables in your diet. Examples include broccoli, asparagus, butternut squash, zucchini, and leafy greens. Try to eat some vegetables with every meal; the more colorful, the better.

Choose grains in their more natural state, not ground into flours, stripped of fiber and other beneficial nutrients. Wild rice, barley, quinoa, millet, and wheat berries are good whole grain examples. Most grains, when ground into flours, act like sugars in the body.

Eat fruits fresh and raw. Cooked and overripe fruits have a higher *GI*.

Nutrient Timing:

Following workouts, replace the carbs burned within 30 minutes. This is the ideal time to eat carb-rich foods.

At any time when you eat carb-rich food, be sure to also include some protein, soluble fiber or healthy fats (monounsaturated fats, omega-3 oil). This is especially important for breakfast and after long periods of fasting.

Do not severely restrict all carbs or follow a very low-carb diet for too long. This can actually result in greater insulin resistance as part of your body's starvation response.

Not all carbohydrates are the same – the importance of glycemic index and glycemic load

Glycemic Index *(GI)* – Ranks carbohydrates on a scale from 0 to 100 based on how much and how quickly a certain amount of a food can raise blood sugar levels after eating. High *GI* foods (*GI* >70) cause rapid fluctuations in blood sugar and insulin response, resulting in a high insulin demand. Low *GI* foods (*GI* < 55) produce a slower and steadier rise in blood sugar, resulting in a more measured and controlled insulin response.

Glycemic Load *(GL)* – The *GL* takes into account the number of carbohydrates in a typical serving size, along with the food's *GI* in assessing the impact of the food on the body's sugar level and insulin level response.

Some foods like pasta have a relatively low *GI*. However, a typical serving of pasta contains a large number of carbs, thus raising the *GL* and the impact on your blood sugar. On the other hand, watermelon has a higher *GI* but far fewer carbs in a serving, resulting in a lower *GL* and less impact on your blood sugar. When you double the serving size, the *GI* does not change but the *GL* doubles as well as the impact it has on your body's blood sugar level and insulin response.

THE GENES WE TESTED

PPARG – glucose homeostasis, fat cell formation
FTO – total food consumption, satiety, body weight
ADIPOQ – insulin resistance and risk of diabetes
KCTD10 – HDL levels in response to carbohydrates
MMAB – carbohydrate effects on fat mobilization
SLC30A8 – insulin secretion

How the GL impacts the diet:

Establish your recommended daily *GL*. Your results on this report will help you determine the most effective *GL* for you. ***Consult Glycemic Load Chart found in Appendix A.***

Example:
A 1600 Calories/day diet consisting of 50-55% of Calories from carbohydrates (200-220 grams of total carbohydrates) with a daily GL target of 110 might start with either of the following two meals:

Breakfast 1:

Food	Calories	Carbs	GI	GL
Two 6" pancakes	460	116 g	67	78
2 oz pancake syrup	200	53 g	72	38
Total:	**660**	**169 g**	**Total GL:**	**116**

Analysis: This one meal contains **80%** of the daily carbs goal and has **exceeded** the entire day's *GL* goal!

Result: Individual is likely to experience a rapid rise in blood sugar with breakfast, demanding a rapid and vigorous insulin spike. The blood sugar then will fall too rapidly and likely drop below normal and the individual will experience fatigue, low energy and increased hunger through much of the morning.

Breakfast 2:

Food	Calories	Carbs	GI	GL
1 cup oatmeal	166	32 g	44	14
½ cup blueberries	42	11 g	25	3
½ cup fruit yogurt	109	21 g	52	11
two eggs	144	1 g	0	0
1 slice wheat toast	60	11 g	45	5
Total:	**521**	**76 g**	**Total GL:**	**33**

Analysis: This one meal contains **36%** of the daily carbs goal and **30%** of the entire days *GL* goal.

Result: Individual is most likely to maintain steady blood sugar levels throughout the morning and not likely to experience hunger before lunch. This individual will be expected to maintain good concentration, not feel tired or fatigued throughout the morning.

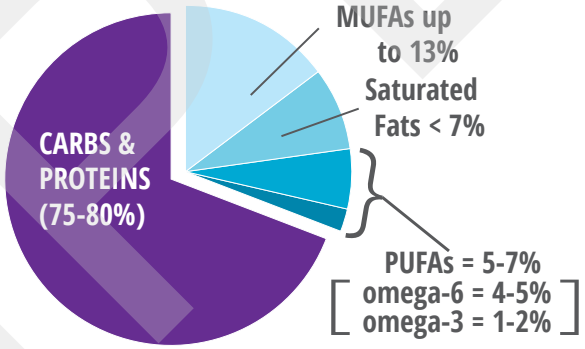
It's not just the *amount* of fat you eat - *the type of fat* plays a more significant role.

Fats are essential nutrients that provide energy and are required for many physiological functions. Genetics play a significant role in how your body uses fats, and where excess dietary fat is likely to be stored for use later. Not all fats are the same– some fats are better for your health than others. Genetic factors also contribute to the extent of harm or benefit derived from consuming different types of fat.

Most foods contain a mixture of different types of fats, see ***Appendix B: Fats & Oils Chart***. The healthier fats include monounsaturated fats (MUFAs) and polyunsaturated fats (PUFAs). Saturated fats are less healthy, and fats that have been modified to trans-fats are harmful, even in small amounts. Omega-6 and omega-3 fats are essential PUFAs that your body cannot make so you must get them from your diet. They are both required for normal growth and development but consuming them in a high omega-6 to omega-3 ratio may promote inflammation and chronic disease.

It is very important to pay attention to your proper ratio of different types of dietary fats. Eat more foods with olive oil and less soybean and sunflower oils.

Your daily fat requirements



- **Reduce saturated fat, omega-6 PUFAs and total fat**
- **Increase omega-3 PUFAs and MUFAs**
- **Ideal ratio of omega-6 to omega-3 is 4:1 or less**

YOUR PERSONALIZED GUIDANCE

Reduce total fat and try to limit saturated fat to 7% or less of total Calories. Replace saturated fat with MUFAs – the majority of fats in your diet should be MUFAs. Olive oil, avocados, hazelnuts, and almonds are high in MUFAs.

Avoid margarine and any solid form of vegetable oil. Check ingredients to avoid foods containing hydrogenated or partially hydrogenated vegetable oils (possible sources of trans fats). It's better to use real butter or ghee (in moderation). Coconut oil is even better when you need a solid fat for cooking – it is high in lauric acid, a saturated fat with many health benefits. Use a variety of nut butters (in moderation) for spreads.

Use extra virgin olive oil for salad dressing and light cooking – it is high in MUFAs, health-protective polyphenols and antioxidants with potent anti-inflammatory and anti-aging benefits. Other healthy choices include walnut, flax and avocado oils. Avoid dressings made with corn, soybean, safflower or sunflower oil.

Increase intake of omega-3 fats to counter inflammation from omega-6 fats. Eat more fish, walnuts, flaxseeds and chia seeds. Supplement omega-3 fats with fish oil. Limit corn and soybean oil because they are very high in omega-6 fats. Limit fried foods and processed foods – high amounts of omega-6 fats and possibly trans fats.

Check ingredients of food labels claiming "no saturated fat" or "reduced fat" – replacing saturated fat with sugar and/or hydrogenated vegetable oils will increase your risk for obesity and type II diabetes.

DIETARY FATS

Type of Fat	Characteristics	Metabolic Effect	Effect on Disease Prevention	Chief Food Sources in U.S. Diet
Trans Fatty Acids (TFAs) – from partially hydrogenated vegetable oils	Solid at room temperature; Hazardous to your health in any amount – FDA does not require manufactures to list quantities less than 0.5 g/ serving	Raises LDL (bad) cholesterol; Lowers HDL (good) cholesterol; Raises lipoprotein[a] levels; Interferes with PUFA metabolism	Raises rate of coronary artery disease; Increases obesity related diseases; Promotes inflammation and related diseases	Stick margarine; commercial baked goods (sweet rolls, cookies, doughnuts); deep fried foods; microwave popcorn; fast food; frozen pizza and pastries; coffee creamer
Saturated Fats	Solid at room temperature; Stable at higher temperatures for grilling and baking; Harmful in excess – *genetic factors are important to determine how much is too much*	Raises LDL (bad) cholesterol; Increases weight gain; Raises HDL (good) cholesterol (lauric acid*)	Promotes immune health (lauric acid*); Protects liver from alcohol and medications; Required for bone health; May increase risk for prostate, colon disease	**Meat** – beef, pork, poultry; **Dairy** – milk, cream, butter; **Tropical oils** – coconut, palm, palm kernel; **Nuts** – cashews, macadamias; *Coconut oil is high in lauric acid, a saturated fat with many health benefits*
Monounsaturated Fatty Acids (MUFAs)	Liquid at room temperature – turns solid when chilled; More health benefits when consumed raw; May be used for light cooking	Lowers LDL (bad) cholesterol – *better response for some genotypes*	Reduces risk for cardiovascular disease; Reduces insulin resistance and T2D; Reduces weight gain (if consumed in moderation)	Olive oil; avocados; canola oil; nuts and nut oils – hazelnuts, macadamia nuts, almonds
Polyunsaturated Fatty Acids (PUFAs); Omega-3	Liquid; Health benefits when consumed raw; Includes the essential fatty acids (EFAs) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).	Raises HDL (good) cholesterol; Reduces obesity and metabolic syndrome	EPA and DHA reduce risk for chronic diseases including cardiovascular disease and diabetes; Protects against oxidative stress and inflammation – *some genotypes are more sensitive*	Parent fatty acid ALA is found in plants – flax, chia seeds, canola oil, walnuts - must be converted to EPA and DHA – found in fish, shellfish
Polyunsaturated Fatty Acids (PUFAs); Omega-6	Liquid; more refined oils are more stable but less healthy; Includes EFA linoleic acid	Arachidonic acid is a metabolite important for inflammation but in excess leads to disease – *some genotypes are more sensitive*	Probably reduces risk for cardiovascular disease; Excess leads to carcinogenesis – *genetic factors apply*	Vegetable oils – soybean, corn, safflower, grape seed oil; Nuts and seeds – sunflower, peanut; Typical American diet is too high in omega-6 fats, the primary source is soybean oil

= strongest genetic correlations

THE GENES WE TESTED

APOA2, FTO, FADS1, LIPC, intergenic

Influence of Genes on Weight

It is critical to know your risk of being overweight before you actually become overweight. Biology is not destiny and it is easier to prevent obesity than it is to lose weight. Genes influence one's susceptibility to become overweight and have an influence on weight-related behaviors. But to what extent these traits are expressed is mediated by environmental factors. **Once any weight gain associated with how these genes are expressed occurs, certain genotypes can make it much more difficult to lose that weight.**

THE GENES WE TESTED

The ***FTO*** gene codes for a fat mass and obesity-associated protein also known as alpha-ketoglutarate-dependent dioxygenase. Certain variants of this gene are widely recognized as being associated with a risk of being overweight and having increased body fat.

The ***MC4R*** gene codes for the melanocortin-4 receptor and regulates appetite and satiety signals in the hypothalamus area of the brain. Mutations in the ***MC4R*** gene represent the most common monogenic association with human obesity.

Be sure to stay hydrated and follow the guidance below to achieve and maintain a healthy body weight.

BODY MASS INDEX (BMI) CHART FOR ADULTS

Weight lbs	100	105	115	110	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
Weight kgs	45.5	47.7	52.3	50.5	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7
5'0" / 152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1" / 154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
5'2" / 157.4	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	33	34	35	36	37	38	39
5'3" / 160.0	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38
5'4" / 162.5	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	31	32	33	34	35	36	37
5'5" / 165.1	16	17	18	19	20	20	21	22	23	24	25	25	26	27	28	29	30	31	31	32	33	34	35	35
5'6" / 167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7" / 170.1	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8" / 172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	32	32
5'9" / 175.2	14	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31
5'10" / 177.8	14	15	15	16	17	18	18	19	20	20	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11" / 180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0" / 182.8	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1" / 185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2" / 187.6	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3" / 190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4" / 193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26
Height in/cm	Underweight				Healthy				Overweight				Obese				Extremely obese							

YOUR PERSONALIZED GUIDANCE

What to eat:

Try to have your favorite meals be healthy. Include plenty of vegetables, fruits and whole grain products, and remove calorie-rich temptations.

What to drink:

Stay hydrated – drink at least ½ ounce of water per pound of bodyweight per day, more if you are active or in hot weather. It's easy to confuse dehydration with hunger. They both produce similar symptoms: fatigue, lightheadedness and feeling weak. Limit sugar-sweetened beverages. Try soaking lemons, limes, mint, berries or cucumbers in water to improve and vary the taste – kids love this! Sparkling mineral water with lemon is a good healthy choice when craving a soda.

How to exercise:

Various types of exercise can stimulate different hormones related to the appetite. Exercising more rigorously will reduce your appetite more than exercising moderately or gently. Activities like jumping rope and weight-bearing exercises will reduce your appetite to a greater extent than riding a bike. Aerobic exercise can decrease the level of *ghrelin*, the hunger hormone, and increase the level of *peptide YY*, an appetite suppressing hormone. Always maintain proper hydration while working out.

WEIGHT REGAIN

MODERATE RISK OF REBOUND WEIGHT GAIN

Regaining Weight After Dieting

Ever wonder why some people have a hard time keeping weight off after dieting?

Weight regain after a diet is your body's evolved response to starvation. Your body is aware that not enough calories are coming in, so it kicks into survival mode. From an evolutionary perspective, the bodies that were best able to survive in times of scarcity (and then pass their genes on to future generations) were those that could use energy efficiently to get by on smaller amounts of food often on an irregular basis. Another quality that would aid survival was a psychological one: a single-minded pursuit of more fuel (food), and once you located it, the overwhelming urge to eat as much as possible of every type of food available.

You should eat frequent smaller meals because your body is likely to go into "starvation mode" and lower its metabolic rate after periods of dieting.

YOUR PERSONALIZED GUIDANCE

Avoid going 'on' and 'off' diets since your risk of weight re-gain is increased. Use caution with restriction diets which may pose a greater challenge for you.

Do not go long periods of time without eating as your body is likely to go into "starvation mode" and lower its metabolic rate. You will be more prone to hunger once food is in sight.

You will need to exercise more to increase your metabolism as you moderate food intake. Various types of exercise can stimulate different hormones related to appetite.

Get plenty of sleep. This will counter the effect of your genetic profile on your level of the hunger hormone, *ghrelin*.

THE GENES WE TESTED

NMB codes for *neuromedin-B*, a satiety peptide, associated with higher levels of disinhibition to eating, susceptibility to hunger and increased body weight gain over time.

LEPR gene mutations can prevent a receptor from responding to leptin, a hormone associated with satiety. This can lead to excessive hunger and is associated with increased weight gain.

MC4R codes for a protein called melanocortin-4 receptor. It is found at its highest density in the hypothalamus in an area associated with appetite and satiety. Variants may also play a role in food choice.

The ***FTO*** gene, also known as the "fat mass and obesity gene," regulates satiety and visual cues to eat.

The Influence of Genes on Appetite

How much you eat is influenced by appetite (the desire to eat) and satiety (the sensation of fullness). Appetite and satiety are influenced by factors including regulatory signals from the gut to the hypothalamus in the brain. There are genetic variants associated with increased appetite, diminished satiety and even one's choice of foods. Individuals who carry risk gene variants often overeat without being aware of it since they are less sensitive to satiety signals. As a result, they may not sense fullness even when they have already eaten more than enough and are predisposed to choose calorie-dense foods.

Be sure to get enough sleep, stay hydrated, reduce stress and stay active to increase levels of appetite suppressing hormones and reduce the tendency to overeat.

YOUR PERSONALIZED GUIDANCE

As a result of genetics, you experience satiety normally and are at only a normal risk for overeating.

Getting enough sleep, reducing stress and staying active will increase your levels of satiety hormones and reduce your tendency to overeat.

Staying hydrated is particularly important for individuals with your genetic profile because of a predilection to choose salty foods and soda. Monitor your intake and limit your access to high salt and "empty" calorie foods. Soak lemons, limes, cucumbers or mint leaves in water to add flavor to promote water intake and proper hydration without adding extra sodium (salt), sugar and artificial ingredients.

Different foods provide different levels of satiety – foods that contain large amounts of water, dietary fiber and/or protein more efficiently satisfy hunger.

Keep some healthy fat in your breakfast. A low-fat breakfast may actually result in you eating more calories throughout the day. The fat in foods spurs the release of *cholecystokinin* (CCK), a hormone that promotes satiety. Fat also delays stomach emptying, maintaining a feeling of fullness for a longer period.

Make sure you get enough fiber, at least 28 grams per day. Dietary fiber helps maintain higher levels of CCK after eating. Soluble fiber also promotes fullness by increasing viscosity and slowing down digestion.

THE GENES WE TESTED

FTO gene affects the hypothalamus region of the brain which regulates appetite, energy intake, and satiety. It can also affect the rate at which fat cells accumulate.

MC4R codes for a protein called melanocortin-4 receptor. It is found at its highest density in the hypothalamus in an area associated with appetite and satiety. Variants may also play a role in food choice.

NMB codes for neuromedin-B, a peptide found in the GI tract and the brain. It is released after eating, travels to the brain and inhibits further food intake.

ADDICTIVE TENDENCIES & IMPULSIVE EATING

NORMAL RISK

Dopamine and Food Reward

In addition to appetite and satiety, your food intake can be affected by your desire for certain types of foods and by the level of reward and comfort that eating provides. *Dopamine* is a chemical messenger that motivates us to eat and participate in other "rewarding" behaviors. As a result of genetics, some individuals have fewer dopamine receptors in the brain, resulting in the individual requiring higher levels of stimulation to feel an equivalent level of reward. Having fewer dopamine receptors is associated with more impulsive tendencies, including the overconsumption of pleasant tasting, palatable foods resulting in an increase in weight and a higher risk of developing obesity.

Cycle of Food Addiction

Impulsive tendencies and addictive behaviors are not increased as a result of your genetics; however, you are still susceptible to other factors, including stress.

THE GENE WE TESTED

The ***ANKK1/DRD2*** gene is associated with the effect of dopamine in the brain, signaling a "feel good" or rewarding sensation. A genetic change from G to A decreases the concentration of dopamine receptors in the brain that can result in the individual requiring higher levels of stimulation to feel an equivalent level of reward. The presence of at least one copy of the (A) variant is associated with more impulsive tendencies, including the overconsumption of pleasant tasting, palatable foods resulting in an increase in weight and a higher risk of developing obesity.

YOUR PERSONALIZED GUIDANCE

On the basis of this gene, you are not likely to have lower dopamine sensitivity and are not at an increased risk for impulsive eating. Stay vigilant for normal urges to overindulge in eating during stressful or emotional times.

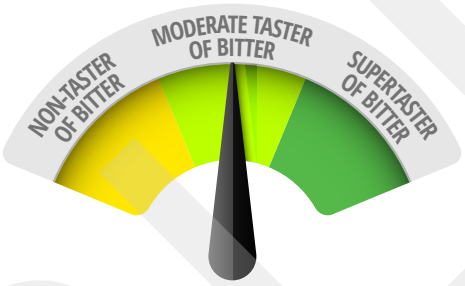
BITTER TASTE

MODERATELY TOLERANT OF BITTERNESS

Evolution of Taste Perception

The ability to distinguish bitter flavors likely enabled our ancestors, back when they were foragers, to identify and avoid consuming potentially toxic plants and other substances hazardous to their health. However, many of the substances that we perceive as bitter, such as glucosinolates found in cruciferous vegetables, offer substantial health benefits. Individuals who perceive bitterness more intensely may avoid eating these healthy vegetables. Others, who are genetically more tolerant of bitterness, have increased eating disinhibition. Eating disinhibition describes the tendency to overeat in response to the availability of tasty food, emotional stress, or in certain social situations.

You should use lemons, limes, herbs, and spices in place of salt and sugar to mask bitter flavors in healthy vegetables.



YOUR PERSONALIZED GUIDANCE

For you, bitter flavors as found in Brassica plants are perceived more intensely. This includes cabbage, cauliflower, broccoli, brussel sprouts, collard greens, kale, and turnips.

Many of the Brassica class of vegetables have significant health benefits. For this reason, it is important to consume this class of vegetables instead of avoiding them. Make an effort to include at least 2-3 servings of a wide variety of vegetables daily.

Consider "green smoothies", blending the leafy greens with ice, ginger, lemon, lime or your favorite fruits to mask any bitter taste.

If you have a tendency to add extra salt or sugar to mask bitter flavors, consider placing containers of various herbs and spices on the table in place of salt and sugar. Examples include oregano, sage, ground rosemary, garlic, cinnamon, ground nutmeg, smoked paprika, etc. Experiment with various flavors and combinations. Always taste your food before reaching for the salt shaker!

THE GENE WE TESTED

The ***TAS2R38*** gene encodes a transmembrane receptor that mediates how we perceive bitterness in certain foods. Variations in the ***TAS2R38*** gene are associated with tolerance to the bite of chili peppers, the pungency of alcohol and with food choice and total food consumption.

CHOLESTEROL RESPONSE

SENSITIVE TO CARBS, GOOD RESPONSE TO EXERCISE

Genetics and Cholesterol Response

Most of the body's cholesterol is found in two types of particles. *Low-density lipoprotein* (LDL), known as 'bad' cholesterol, contributes to heart disease by 'sticking' to and narrowing the arteries supplying the heart and other tissues. *High-density lipoprotein* (HDL), the 'good' cholesterol, keeps the LDL level in check.

Plasma levels of HDL have a strong inherited basis with heritability estimates of 40-60%. This includes genetic factors that influence the extent to which your diet and exercise affect both your HDL and LDL cholesterol levels. Certain genetic variants of the ***MMAB*** and ***KCTD10*** genes interact with dietary carbohydrates to modulate HDL cholesterol levels. Genetic variants of the ***PPARG*** and ***LIPC*** genes interact with dietary fats to impact LDL cholesterol. The ***PPARG*** and the ***LIPC*** genes have been associated with the extent to which exercise might raise your HDL cholesterol level.

YOUR PERSONALIZED GUIDANCE

Replacing saturated fats with monounsaturated fats (MUFAs) such as nuts and nut butter, avocados, and olive oil will aid in lowering your LDL (bad) cholesterol. To be most effective, you also need to reduce total dietary fat and increase omega-3 fats.

Your genetic profile indicates that a diet rich in refined and high glycemic index carbohydrates is more likely to lower your HDL (good) cholesterol more than it will for others.

You have a genetic profile that indicates your HDL cholesterol should respond well to regular exercise.

Raise your HDL (good) cholesterol:

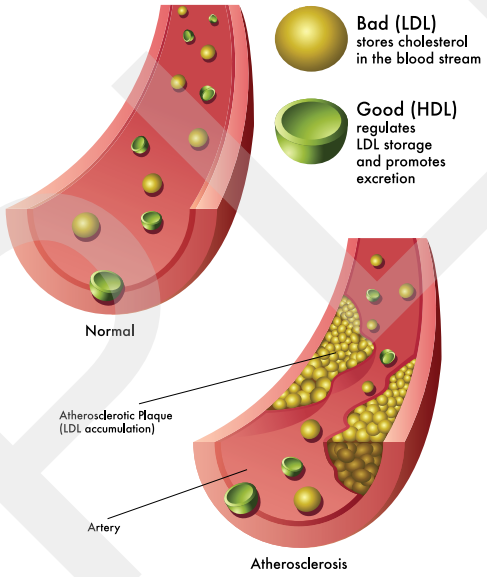
- Limit added sugar and refined carbs in your diet
- Increase omega-3 fats (fish oil) in your diet
- Replace refined carbs with MUFAs
- Aerobic/endurance exercise 20 min x 4 days/wk

Lower your LDL (bad) cholesterol:

- Limit processed foods and *trans* fats
- Lower saturated fat and total fat intake
- Increase omega-3 fats (fish oil)
- Replace saturated fats with MUFAs

Improving LDL (bad) cholesterol with diet may be more challenging, so limit total fat and saturated fats while increasing omega-3 fats. Your HDL (good) cholesterol will improve with regular exercise and by limiting added sugar and refined carbs.

Bad vs. Good Cholesterol



Understanding Cholesterol Numbers

TOTAL CHOLESTEROL	
Desirable	below 200 mg%
Borderline high	200-239
High	above 240
LDL (BAD) CHOLESTEROL	
Optimal	below 100 mg%
Near/above optimal	100-129
Borderline high	130-159
High	160-189
Very high	Above 190
HDL (GOOD) CHOLESTEROL	
Optimal	above 60 mg%
Low	below 40
TRIGLYCERIDES	
Normal	below 150 mg%
Borderline high	150-199
High	200-499
Very high	above 500

THE GENES WE TESTED

MMAB, KCTD10, PPARG, LIPC

The Importance of Inflammation

Your genetics play a role in the body's inflammatory response. Those with a tendency toward a more aggressive inflammatory response can often combat the severity of the inflammation by eating more omega-3 rich foods or taking omega-3 supplements such as fish oil.

Inflammation is a component of the body's immune response. Without it, our body cannot fight infections or heal itself from injuries. When it is out of control— it can result in annoyances, such as allergies, or result in permanent damage as seen in Rheumatoid arthritis. The body's inflammatory response is also thought to play a role in obesity, heart disease, and cancer.

Selecting a Fish Oil Supplement

There is only 300 mg of omega-3 fatty acids in every 1000 mg of most fish oil capsules. If taking supplements to obtain the desired intake, be sure to read labels and check serving size of the omega-3 portion of the total fish oil. You may need to take more than one capsule of most supplements in order to obtain the recommended 2,000 mg of omega-3 fatty acids. **Look for grams of omega-3 fats. Specifically, EPA and DHA have the greatest benefit (not grams of "fish oil").**

Supplement Facts

Serving Size: **2 Soft Gels**

Amount Per Serving		% Daily Value*
Calories	25	
Calories from fat	25	
Total Fat	2.5 g	4%
Saturated Fat	0 g	0%
Trans Fat	0 g	†
Total Omega-3s	2150 mg	†
EPA (Eicosapentaenoic Acid)	1125 mg	†
DHA (Docosahexaenoic Acid)	875 mg	†
Other Omega-3s	150 mg	†

* Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established.
Less than 5 mg of Cholesterol per serving.

You should increase your intake of omega-3 fats, while limiting sugar, refined carbs, and vegetable oils.

THE GENES WE TESTED

FADS1 – affects the synthesis of arachidonic and eicosapentaenoic acids which are precursors for inflammatory molecules such as the eicosanoids.

FUT2 – influences gut flora which impacts immune response, inflammation, detoxification and digestion.

ADIPOQ – codes for adiponectin, a collagen like protein with anti-diabetic, anti-atherogenic and anti-inflammatory properties

PPARG – strongly associated with adiponectin levels, especially in response to diets high in sugar and refined carbs.

YOUR PERSONALIZED GUIDANCE

Your genetic profile indicates that you may have an increased risk of inflammatory responses. You will likely benefit from consuming more than the normal minimum daily recommendation of 500 mg of omega-3 fatty acids. The omega-3 fats from fish oil, *eicosapentaenoic acid* (EPA) and *docosahexaenoic acid* (DHA) are more biologically effective at modifying your body's inflammatory response than *alpha-linoleic acid* (ALA), the omega-3 found in plant sources.

You are also more prone to the inflammatory effects of a diet high in sugar, refined carbs and vegetable oils. Soybean, corn, and safflower oils are very high in omega-6 fats which promote inflammation and compete with omega-3 fats in the body. Many restaurants fry foods in these oils because they are cheaper and more stable at high temperatures. This is another potent reason to limit fried food when dining out.

Digestion of Lactose

Lactase is the enzyme responsible for the digestion of lactose, the sugar in milk. The activity of lactase is dramatically reduced in most mammalian species after weaning. **After age 2, milk is no longer necessary** for human growth, and may not be the best source of calcium for bone health. Most **lactose intolerance** is due to insufficient lactase activity, resulting in symptoms like gas, bloating and diarrhea after consuming dairy. **Lactase persistence** is the continued activity of this enzyme into adulthood, allowing adults to consume dairy products without these symptoms. Of note is that many lactose-containing dairy products have a relatively high fat content and are calorie dense.

YOUR PERSONALIZED GUIDANCE

The amount of lactose you can tolerate varies depending on the level of lactase enzyme still produced, and how sensitive you are to gastrointestinal disturbances.

Fermented dairy products that are not pasteurized will have significant natural enzyme levels that contribute to the digestion of lactose, making them easier to tolerate. These include kefir and yogurt with probiotics.

Many kinds of cheese, especially the drier and more aged cheeses, may contain little to no lactose and will cause few problems despite lactase insufficiency. Processed cheeses such as American and Swiss may have a wide range of lactose content. Such products can contain up to 14% lactose.

Since lactose is the sugar found in milk, the fewer grams of sugar on the nutritional label of dairy products, the better.

Many people consume dairy to prevent bone loss. But in later childhood and beyond, dairy may not be the best source of calcium. The calcium contained in foods such as broccoli, beans, nuts, kale and other dark green leafy vegetables is better absorbed and more easily used by the body to ensure good bone health.

You should avoid or limit dairy containing more than 2% lactose to reduce gas, bloating, and other symptoms of lactose intolerance.

Lactose Content of Common Dairy Products

Dairy Product	Lactose % (g/100g)
Nonfat Dry Milk	51.3%
Processed Cheese Slices (American, Swiss)	Up to 14%
Sweetened Condensed Milk	12.9%
Velveeta	9.3%
Ice Cream, Gelato, Sherbet	7.6%
Nonfat (Skim) Milk	5.2%
2% Low-fat Milk	4.9%
Whole Milk	4.8%
Feta Cheese	4.1%
Yogurt, Kefir *	4.0%
Sour Cream	3.9%
Cottage Cheese (2% fat)	3.6%
Parmesan (grated in a can)	2.9-3.7%
Swiss **	0.0-3.4%
Parmesan (hard) **	0.0-3.2%
Mozzarella (part-skim) **	0.0-3.1%
Gouda **	0.0-2.2%
Cheddar **	0.0-2.1%
Edam **	0.0-1.4%

** fermented dairy may be digested easier*

*** should be be safe for you to consume*

THE GENE WE TESTED

The ***MCM6*** gene regulates the expression of the gene that encodes for the lactase enzyme. Inheriting one or two copies of the (A) version of the ***MCM6*** gene leads to lactase persistence.

Caffeine is Not Just in Coffee

Caffeine is the most commonly consumed stimulant in the world. Sources of caffeine include coffee, tea, energy drinks, soft drinks and even certain medications. As a result of genetics, some individuals experience less stimulating effects from caffeine and are more likely to consume in excess. Others have longer lasting stimulating effects, increased heart rate, and restlessness. Excessive caffeine consumption can lead to dehydration, decreased bone density, heartburn, headaches, arthritis and problems absorbing minerals from foods.

Caffeine Content in Common Foods & Beverages

PRODUCT	SERVING	CAFFEINE
Drip Coffee Dark Roast	8 ounce	60-100 mg
Drip Coffee Light Roast	8 ounce	90-200 mg
French Press Coffee	8 ounce	80-100 mg
Espresso Shot	1 ounce	30-50 mg
Instant Coffee	1 Tablespoon	50-60 mg
Decaf Coffee	8 ounce	2-12 mg
Black Tea	8 ounce	14-70 mg
Green Tea	8 ounce	24-45 mg
Chai Tea	8 ounce	60-120 mg
Iced Tea (instant)	8 ounce	7-45 mg
Coca Cola Classic	1 can	35 mg
Diet Coke	1 can	45 mg
Mountain Dew	1 can	54 mg
Barq's Root Beer	1 can	23 mg
Coffee Ice Cream	4 ounce	17-52 mg
Red Bull Energy Drink	8.4 ounce	80 mg
Excedrin Pain Reliever	1 tablet	65 mg
Guarana Seeds	1 gram	47 mg
Guarana Extract	1 tablet	90-200 mg

Reduced stimulating effects of caffeine may result in excessive consumption, leading to other adverse consequences – you should consume no more than 400 mg (the amount in four cups of coffee) per day.

Your Recommended Maximum Daily Caffeine Intake

THE GENE WE TESTED

The ***CYP1A2*** gene codes for an enzyme that is responsible for 95% of your body's metabolism of caffeine. Variations of this gene can impact your susceptibility to the effects and side effects of caffeine. Inheriting one copy of the (C) version of the ***CYP1A2*** gene results in slower metabolism of caffeine, two copies will reduce metabolism even further.

YOUR PERSONALIZED GUIDANCE

Since you metabolize caffeine more rapidly than many others, you may not experience as intense stimulating effects from caffeine such as decreased fatigue, nervousness, fast heart rate and increased blood pressure. If ignored, this can lead to excessive caffeine consumption which can still lead to other adverse consequences such as gastric acidity, heart burn, acid reflux, decreased bone density, increased incidence of rheumatoid arthritis, frequent headaches and problems with mineral absorption (especially iron).

Caffeine consumption can cause dehydration. Even mild dehydration can drain your energy. If you drink coffee regularly, you may find that you feel more energized by drinking a glass of water. Consider this before refilling your coffee cup to fight that afternoon fatigue. Consider substituting tea for coffee. The tannic acid in tea helps slow the release of caffeine into the system and may help remove toxins from the intestines.

Consume no more than 400 mg of caffeine per day and no more than 200 mg within any one hour.

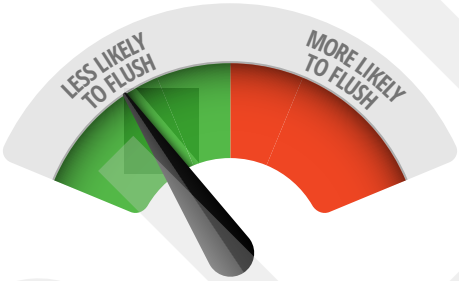
ALCOHOL

LESS LIKELY TO EXPERIENCE ALCOHOL FLUSH

Alcohol Flush Reaction

The gene ***ALDH2*** codes for an enzyme that processes acetaldehyde, a step in the metabolism of grain alcohol (ethanol). A variant version of this gene slows this reaction, resulting in increased levels of acetaldehyde which is toxic at high levels. This results in flushing, skin blotches, headaches and sometimes increased heart rate and blood pressure. With prolonged exposure to alcohol over time, it is felt these variants can also increase the risk of certain types of cancer as well. If you inherit one or more copies of the (A) variant of ***ALDH2***, you have a higher likelihood of experiencing the Alcohol Flush Reaction after drinking alcoholic beverages.

You should adhere to standard guidelines for alcohol consumption.



GUIDANCE

Excess alcohol consumption, whether or not it turns the face red, can increase the risk of liver disease, nerve problems, birth defects, nutritional deficiencies, many types of cancer, and mental health problems.

Because of decreased unpleasant effects from the acute ingestion of alcohol, you should be aware there may be an increased tendency to drink more, and it is advised to moderate alcohol intake if you drink at all.

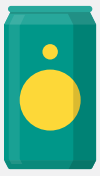
Individuals with this genotype who do drink more than eight drinks per week may run a higher risk of increased blood pressure.

THE GENE WE TESTED

If you inherit one or more copies of the (A) variant of ***ALDH2***, you have a higher likelihood of experiencing the Alcohol Flush Reaction after drinking alcoholic beverages.

Guidelines for Alcohol Consumption

The 2010 U.S. CDC Guidelines recommend that if alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age. This is not intended as an average over several days, but rather the amount consumed on any single day.

12 fl. oz of regular beer	5 fl oz of table wine	1.5 fl oz 80 proof liquor
		
about 5% alcohol	about 12% alcohol	about 40% alcohol

The percent of "pure" alcohol, expressed here as alcohol by volume (alc/vol), varies by beverage.

VITAMIN A

NORMAL VITAMIN A FORMATION FROM BETA-CAROTENE

Importance of Carotenoid Conversion to Vitamin A

There are two sources of vitamin A in the diet: carotenoids and retinoids. Carotenoids, such as beta-carotene, are found in brightly colored fruits and vegetables. Retinoids, including retinol, are only found in animal products. The retinoid form of vitamin A is important for vision support and all forms of cell growth. Carotenoids provide antioxidant and anti-inflammatory benefits, and a portion of the body's carotenoids can be converted into retinoids, active vitamin A.

Avoid consuming excessive amounts of plant and animal sources high in vitamin A. Be sure to adhere to standard recommended guidelines.

Expect normal carotenoid and vitamin A levels.

Consult your healthcare provider before taking supplements containing fat soluable vitamins, such as A, D, E, and K.

YOUR PERSONALIZED GUIDANCE

You convert beta-carotene, found in fruits and vegetables, into active metabolites of vitamin A at a normal rate. You should be able to form adequate levels of active vitamin A from brightly colored and dark green vegetables and fruits.

Vitamin A deficiency is relatively rare if you eat a balanced diet consisting of both plant and animal sources. Sufficient amounts of protein and fats, specifically monounsaturated and omega-3 polyunsaturated fats, will ensure your body's vitamin A needs are met.

Large amounts of supplemental active vitamin A (but not beta-carotene) can be harmful to bones and lead to jaundice, nausea, loss of appetite, irritability, headaches, vomiting, and even hair loss.

Recommended daily intake of vitamin A

Adult Males:	900 mcg (3,000 IU)
Adult Females:	700 mcg (2,333 IU)
Maximum Safe Limit	**3,000 mcg (10,000 IU)**

GOOD PLANT FOOD SOURCES OF CAROTENOIDS (CONVERTED TO VITAMIN A)			
Food	**Quantity**	**Calories**	**% Daily Value**
Sweet potato	1 cup	180	214
Carrots	1 cup	50	113
Spinach	1 cup	41	105
Kale	1 cup	36	98
Winter squash	1 cup	76	59
Romaine lettuce	2 cups	16	45
Cantaloupe	1 cup	54	30
GOOD ANIMAL FOOD SOURCES OF RETINIODS (ACTIVE VITAMIN A)			
Beef liver	4 ounces	130	431
Shrimp	4 ounces	135	11
Eggs	1 each	78	8
Milk, cow's	4 ounces	74	6

THE GENE WE TESTED

The ***BCMO1*** gene encodes for the enzyme that converts carotenoids into active retinoids (vitamin A). This conversion rate is highly variable between individuals and correlates with two common alterations on this gene. Studies show that 27-45% of the general population are poor converters which leads to higher carotenoid levels.

VITAMIN D

STANDARD VITAMIN D REQUIREMENTS

Vitamin D – Calcitriol

Vitamin D is an essential vitamin required by the body for the absorption of calcium, bone development, immune functioning and the alleviation of inflammation. Vitamin D is obtained from the diet and also by dermal synthesis (with sunlight). This form of the vitamin is inactive and must be converted, first by the liver and then by the kidney to the biologically active form, *calcitriol*.

There are two forms of vitamin D found in supplements. Vitamin D2, also known as ergocalciferol, is found in plants and vitamin D3 or cholecalciferol is generated in the skin of animals when light energy is absorbed. **Vitamin D3 is the preferred form for supplementation and is the form your body produces naturally from exposure to sunlight.**

For you, consuming foods high in vitamin D and getting short incidental exposure to the sun should ensure adequate vitamin D levels.

Consult your healthcare provider before taking supplements containing fat soluable vitamins, such as A, D, E, and K.

GOOD FOOD SOURCES OF VITAMIN D			
Food	**Quantity**	**Calories**	**% Daily Value**
Salmon	4 ounces	158	128
Sardines	3.2 ounce can	189	44
Milk, cow's	8 ounces	148	32
Tuna	4 ounces	147	23
Eggs	1 each	78	11
Mushrooms, shiitake	½ cup cooked	41	5

THE GENE WE TESTED

The ***GC*** gene codes for a protein that binds to vitamin D and its metabolites and transports them to the target tissues. The (G) version of the ***GC*** gene is strongly correlated with reduced vitamin D levels and even the development of rickets (vitamin D deficiency) in some populations.

YOUR PERSONALIZED GUIDANCE

Inter-individual vitamin D levels can vary significantly, and genetics account for up to half of this variability. Other factors that may cause your vitamin D levels to be reduced include low sun exposure, a vegan or very low-fat diet, older age, dark skin and poor liver or kidney function.

Prolonged sun exposure does not cause your vitamin D levels to increase above normal but it does increase your risk of skin cancer. Short incidental exposure to the sun, such as walking from the office to lunch, is the optimal and usually sufficient way to produce adequate vitamin D.

Ingestion of excessive quantities of vitamin D over periods of weeks to months can be quite toxic to humans and animals. In fact, baits containing large quantities of vitamin D are used very effectively as rodenticides. Excess vitamin D can result in the body absorbing too much calcium which increases the risk of heart disease and kidney stones.

Recommended daily intake of vitamin D
Males and females ages 4-70: 600 IU/day

Vitamin E – α-tocopherol

Vitamin E is a fat-soluble antioxidant that protects cells in your body from the damaging effects of free radicals. Free radicals are produced in your body as nutrients from foods are converted to energy, and from environmental exposure to air pollution and ultraviolet radiation from the sun. Additionally, Vitamin E is utilized by the immune system and is essential in keeping blood vessels healthy. Of the eight different chemical forms of Vitamin E, α-tocopherol is the most biologically active and most abundant form present in the body. The synthetic forms of vitamin E, often found in some fortified foods and supplements, are less biologically active.

Consult your healthcare provider before taking supplements containing fat soluable vitamins, such as A, D, E, and K.

GOOD FOOD SOURCES OF VITAMIN E			
Food	**Quantity**	**Calories**	**% Daily Value**
Sunflower seeds	¼ cup	204	82
Almonds	¼ cup	132	40
Spinach	1 cup cooked	41	25
Swiss chard	1 cup cooked	35	22
Avocado	1 cup	240	21
Peanuts	¼ cup	207	20
Asparagus	1 cup cooked	40	18

You should maintain healthy blood triglyceride levels and consume foods high in vitamin E to ensure adequate vitamin E levels.

THE GENE WE TESTED

The presence of an A allele at *rs12272004*, a particular intergenic region (an area between genes), has a very strong association with increased α-tocopherol levels. If you inherited a copy of the (A) allele at the position *rs12272004*, your α-tocopherol levels might be increased. However, the increased level only occurs if the triglyceride level is normal and is attenuated as the triglyceride level rises.

YOUR PERSONALIZED GUIDANCE

Your genotype is not associated with increased α-tocopherol levels. This indicates that your levels are not out of balance or abnormal. Ensure that you include natural food sources of vitamin E in your diet.

You can balance your vitamin E level and reduce your risk of obesity and cardiovascular disease by reducing your triglycerides:

- Maintain a healthy weight and include regular moderate exercise.
- Limit alcohol, saturated fat, sugar and refined carbohydrates.
- Eat more fresh vegetables and other natural food sources of vitamin E.
- Increase omega-3 fats in your diet to lower triglycerides and boost your vitamin E level.

Over-consumption of vitamin E (from supplements) can be harmful, especially for small children. Symptoms of excessive vitamin E supplementation include an increased bleeding tendency, blotchy skin, hemolysis (ruptured blood cells) and decreased production of thyroid hormone.

Recommended Daily Intake of Vitamin E

Males and females over 14 years:	15 mg (22.5 IU)
Pregnant females of any age:	15 mg (22.5 IU)
Breastfeeding females of any age:	19 mg (28.5 IU)

Vitamin B6 – Pyridoxine

Vitamin B6 is needed for healthy brain development and function. It also plays a role in the body's production of the neurotransmitters serotonin and norepinephrine which can influence mood. Melatonin, which helps regulate the body clock, also requires B6. Also, B6 along with all B vitamins is required in the process of converting food into energy. Along with vitamin B12 and folate, vitamin B6 also helps control your blood level of homocysteine, an amino acid that may be associated with heart disease. Vitamin B6 is also needed to absorb B12 adequately.

GOOD FOOD SOURCES OF VITAMIN B6

Food	Quantity	Calories	% Daily Value
Tuna	3 ounces	112	44
Salmon, wild	3 ounces	177	40
Turkey, light meat	3 ounces	125	34
Pork, sirloin	3 ounces	174	33
Beef, lean rib	3 ounces	159	30
Chicken, breast	3 ounces	140	28
Garbanzo beans	½ cup	143	25
Brown rice, cooked	1 cup	215	23
Banana	1 fruit	105	22
Spinach, cooked	1 cup	41	22
Avocado	1 fruit	228	20
Sunflower seeds	1 ounce	116	19
Pistachio nuts	1 ounce	161	16

You should eat more foods high in vitamin B6 because you have increased clearance, resulting in lower vitamin B6 levels.

THE GENE WE TESTED

The ***NBPF3*** gene codes for a protein which plays an important role in neurogenetic development. A polymorphism in the ***NBPF3*** gene is associated with vitamin B6 levels. If you inherited one or two copies of the (C) version, your needs may be increased.

YOUR PERSONALIZED GUIDANCE

Your genetic profile has been associated with having a vitamin B6 blood concentration that is *1.45 ng/mL lower* than average. This is a result of more rapid clearance of the vitamin from your body. You may benefit from increasing your intake of foods containing a high amount of vitamin B6.

Good food sources of vitamin B6 include fish, poultry, meats, some fruits, nuts, seeds, and legumes. Some whole grains are also good sources of vitamin B6. However, the amount of B6 in processed and refined grains is heavily dependent on whether they have been fortified.

A mild deficiency of vitamin B6 is relatively common, while a clinically significant deficiency is unusual.

A significant vitamin B6 deficiency in adults may cause health problems affecting the nerves, skin, mucous membranes, and circulatory system. In children, the central nervous system can be affected. A deficiency can occur in individuals with impaired kidney function as well in those who suffer from chronic alcoholism, liver scarring, an overactive thyroid, malabsorption problems, heart failure and also in those taking certain medications, particularly certain seizure medications. If you have a concern about this, seek advice from your healthcare provider.

Recommended daily intake of vitamin B6

Males and females ages 19-50:	1.3 mg
Males over 51 years:	1.7 mg
Females over 51 years:	1.3 mg

Vitamin B9 – Folate

Folate refers to both the natural folates found in food and to folic acid, the synthetic form found in fortified foods and supplements. Folate is essential for brain development and nerve function. It helps control levels of homocysteine in your blood, an amino acid that may be associated with heart disease. Also, an inadequate folate status during early pregnancy increases the risk of certain birth defects.

GOOD FOOD SOURCES OF FOLATE

Food	Quantity	Calories	% Daily Value
Lentils	1 cup	230	90
Pinto beans	1 cup	245	74
Garbanzo beans	1 cup	269	71
Asparagus	1 cup	40	67
Spinach	1 cup	41	66
Black beans	1 cup	277	64
Avocados	1 fruit	322	41
Turnip greens	1 cup	29	42
Broccoli	1 cup	55	42
Beets	1 cup	75	34

You will benefit from eating more foods high in folate, because you have slightly reduced folate metabolism.

THE GENE WE TESTED

A common variant in the ***MTHFR*** gene has been associated with lowered folate and elevated homocysteine levels in the blood. The ***MTHFR*** gene codes for methylenetetrahydrofolate reductase, an enzyme that activates folate (or folic acid) by adding a methyl group to it. Activated folate goes on to transfer its methyl group to other nutrients and substances, essential to form neurotransmitters, create immune cells, process hormones, produce energy and detoxify chemicals. If you inherited two copies of the (G) allele, you should have normal folate metabolism.

YOUR PERSONALIZED GUIDANCE

You have a version of the MTHFR gene which results in slightly reduced folate metabolism. Dietary folate has a greater impact on your homocysteine and activated folate levels. If you eat a sensible diet, your levels are likely to be in the normal range. If you do not include folate-rich foods in your diet, your activated folate levels are more prone to begin falling.

Increase folate in your diet by consuming more beans, lentils, spinach, asparagus, and avocados. Supplementing with activated methyl-folate will be more effective than folic acid. Since many of the processes in folate metabolism also require vitamins B6 and B12, ensure adequate amounts of these in your diet to maximize the absorption and metabolism of folate.

Recommended daily intake of folate:

Males over 13 years:	400 mcg
Females over 13 years:	400-600 mcg
Pregnancy, all ages:	400-600 mcg
Breastfeeding females, all ages:	500 mcg

Vitamin B12 – Cobalamin

Vitamin B12, also called cobalamin, is one of eight B vitamins. It plays an vital role in the functioning of your brain and nervous system and is also required to form blood cells and regulate DNA synthesis. A deficiency of vitamin B12 is more often related to poor intestinal B12 absorption rather than to dietary deficiency.

YOUR PERSONALIZED GUIDANCE

You have the most common variant *FUT2* gene. It is the configuration most likely to be associated with lower B12 levels in the blood.

Vitamin B12 is found naturally only in animal-derived foods such as shellfish, meat, and eggs. Plant foods have no vitamin B12 unless they are fortified with some form of vitamin B12. A strict vegan diet will likely require supplementation.

People who do not get enough vitamin B12 may feel tired or have a lack of energy. Prolonged deficiency can lead to anemia, memory loss and other neurological problems.

Low folate (another B vitamin) can exacerbate symptoms of B12 deficiency. If you need to supplement with B12, it may be advisable to also take a vitamin B complex with folate to ensure optimal B12 status.

If there is a need to supplement with B12, a quality supplement in the form of a sublingual (under the tongue) tablet or an intramuscular injection will bypass the gut and avoid any potential malabsorption issues.

Recommended daily intake of vitamin B12
Adult males and females: 2.4 mcg

You should eat more foods high in vitamin B12 because you have decreased absorption, resulting in lower vitamin B12 levels.

GOOD FOOD SOURCES OF VITAMIN B12			
Food	**Quantity**	**Calories**	**% Daily Value**
Clams	4 ounces	168	1868
Oysters	4 ounces	77	544
Salmon	4 ounces	157	236
Tuna	4 ounces	147	111
Lamb	4 ounces	310	105
Liver, beef	4 ounces	153	94
Eggs	1 each	78	23
Milk, cow's	4 ounces	74	23

THE GENE WE TESTED

A common variant of the ***FUT2*** gene has been strongly correlated with vitamin B12 levels. The ***FUT2*** gene codes for an enzyme that ultimately affects the production of Intrinsic Factor (IF), which is required for intestinal B12 absorption. A lack of Intrinsic Factor is the most common cause of vitamin B12 deficiency. Carriers of the (A) version of the ***FUT2*** gene have been shown to have lower concentrations of certain gut bacteria as well as a slightly increased risk of developing Crohn's Disease. The same mutation (A) is also associated with a higher B12 level.

YOUR GENETIC RESULTS

Gene	Item	Most Common	Result
Weight			
FTO	diet, satiety, BMI, obesity	TT	TT
MC4R	obesity, weight gain	TT	TT
FTO	weight loss	AA	GA
ANKK1/DRD2	obesity, food reward/response	GG	GG
FTO	diet, satiety, BMI, obesity	CC	CC
APOA2	lipid metabolism, BMI	AA	GG
PPARG	plasma lipid levels, weight loss	CC	CC
Diet, Metabolism & Taste			
CYP1A2	caffeine metabolism	AA	AA
MCM6	lactose tolerance	GG	GG
ALDH2	alcohol tolerance	GG	GG
TAS2R38	eating, perception of bitter	CC	GG
TAS2R38	eating, perception of bitter	GG	GG
LEPR	appetite, food intake, body weight	AA	AG
NMB	hunger, obesity	GG	TG
ANKK1/DRD2	food reward/response	GG	GG
ADIPOQ	glucose levels, BMI, weight loss/regain	GG	GG
FTO	satiety	TT	TT
LIPC	plasma lipid levels, HDL levels	CC	CC
APOA2	lipid metabolism, BMI	AA	GG
PPARG	plasma lipid levels, weight loss	CC	CC
FADS1	fatty acids response	TT	CT
KCTD10	cholesterol & lipid metabolism	GG	GG
MMAB	HDL levels	GG	CC
Vitamins			
BCMO1	vitamin A, β-carotene metabolism	CC	CC
BCMO1	β-carotene metabolism	AA	TA
NBPF3	vitamin B6 level, pyridoxine	CC	TC
MTHFR677	folate levels	GG	AG
FUT2	vitamin B12 levels	GG	GG
GC	cholecalciferol,vitamin D deficiency	TT	TT
intergenic	vitamin E levels, tocopherols	CC	CC
Exercise			
LIPC	training induced changes in HDL and VLDL	CC	CC
PPARD	elite level athletes	TT	TC
INSIG2	increased sub-q fat w/ resistance training	GG	GC
PPARGC1A	enhanced oxidative capacity	CC	TC
ACTN3	"fast" glycolytic muscle fibers	CC	TT
SLC30A8	zinc stores, delayed muscle soreness	CC	TC
MMP3	Achilles tendinopathy, ACL rupture	CC	CT

APPX A: GLYCEMIC LOAD CHART

BAKERY ITEMS						
FOOD ITEM	**FORM**	**SERVING SIZE**	**CALORIES**	**CARBS**	**GLYCEMIC INDEX**	**GLYCEMIC LOAD, STANDARD SERVING**
angel food cake	prepared from mix	1/12th (50 g)	128	29 g	66	19
bagel, plain	NY style	3.3 oz	289	56 g	69	39
bread stick, Olive Garden	stick	1 breadstick	140	26 g	46	12
bread, multi whole grain	slice	2 slices	138	22 g	45	10
bread, white	slice	2 slices	130	28 g	73	20
bread, whole wheat	slice	2 slices	120	22 g	45	10
cake mix, vanilla	Betty Crocker	1 slice (43 g)	178	35 g	71	25
doughnut	Krispy Kreme	1 glazed	200	22 g	55	12
French baguette	2" slice	1 (3.3 oz)	160	32 g	80	26
frosting, vanilla	Betty Crocker	2 Tbs (33 g)	140	23 g	61	14
hamburger bun	medium	45 g	109	20 g	61	12
pita, white	enriched, 6½"	1 piece	165	33 g	64	21
pita, whole wheat	6½"	1 piece	170	35 g	49	17
tortilla, corn	1	45 g	100	20 g	52	11
tortilla, flour	1	2 oz	140	29 g	30	9

BEANS & NUTS						
FOOD ITEM	**FORM**	**SERVING SIZE**	**CALORIES**	**CARBS**	**GLYCEMIC INDEX**	**GLYCEMIC LOAD, STANDARD SERVING**
almonds	oil roasted	2 oz	340	10	0	0
baked beans	Campbells, sugar & bacon	1/2 cup	160	30	37	11
black beans	cooked, w/ salt	1/2 cup	114	21	34	7
cashew	oil roasted	2 oz	325	17	28	5
garbanzo beans	chickpeas, canned	1/2 cup	143	27	44	12
hazelnuts	dry roasted	2 oz	362	10	0	0
kidney beans	canned	1/2 cup	113	20	33	7
lentils	cooked, boiled	1/2 cup	113	20	33	7
peanuts	oil roasted	2 oz	335	9	0	0
peanuts	dry roasted	2 oz	328	12	0	0
pecans	uncooked	2 oz	387	8	0	0
pinto beans	canned	1/2 cup	103	19	38	7
tofu	okara	1/2 cup	47	8	53	4
walnuts	dried	2 oz	346	5	0	0

BEVERAGES						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
almond milk	sweetened	1 cup (240 g)	40	2 g	30	1
apple juice	unsweetened	8 oz	117	28 g	41	6
diet soda	can	12 oz	1	0.1 g	0	0
energy shot, 5 hour	2 oz bottle	1 shot	4	<1 g	0	0
orange juice	fresh	8 oz	112	26 g	24	6
Red Bull	8.3 oz can	1 can	115	28 g	75	21
tomato juice	Campbells	8 oz	41	10 g	10	4
soda, Coca Cola	can	12 oz	158	37 g	63	23

BREAKFAST PRODUCTS						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
All Bran	Kellog's	½ cup	81	23 g	35	8
Captain Crunch	Quaker	1 cup	145	31 g	68	21
Cocoa Pops	General Mills	1 cup	144	31 g	68	21
Corn Flakes	Kellog's	1 cup	101	24 g	71	17
Cream of Wheat	Nabisco, w/ water	1 cup	149	32 g	47	15
egg	medium	1, cooked	72	0.4 g	0	0
Fruit Loops	Kellog's	1 cup	118	26 g	69	18
fruit preserves	commercial	1 oz (2 Tbs)	112	28 g	64	18
Fruity Pebbles	Post	1 cup	144	32 g	72	23
granola cereal	dry, homemade	½ cup	299	33 g	48	16
Grapenuts	Post	½ cup	208	46 g	61	28
jams, jellies	commercial	1 oz (2 Tbs)	112	30 g	66	16
Lucky Charms	General Mills	1 cup	142	29 g	66	19
Meuslix	Kellog's	¼ cup	196	40 g	60	24
oatmeal, instant	Quaker, maple	1 packet (43 g)	157	31 g	45	14
oatmeal, plain	prepared w/ water	1 cup	166	32 g	44	14
pancake syrup	Log Cabin	¼ cup (2 oz)	200	53 g	72	38
pancakes	6 "	2, plain	460	116 g	67	78
peanut butter bars	Nature Valley	1 pouch	190	28 g	54	15
Raisin Bran	Kellog's	1 cup	170	42 g	60	25
Special K, plain	Kellog's	1 cup	117	22 g	64	14
waffle, frozen	4 "	2 waffles(64 g)	190	30 g	53	16
Wheaties	General Mills	1 cup	132	29 g	59	17

DAIRY						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
almond milk	sweetened	1 cup (240 g)	40	2 g	30	1
cheese, mozarella	shredded, whole milk	½ cup (56 g)	168	1 g	<1	2
cheese, sharp cheddar	diced	½ cup (66 g)	261	1 g	<1	1
chocolate, milk	w/ whole milk	1 cup (250 g)	208	26 g	50	13
Greek yogurt	plain	½ cup (100 g)	87	3 g	100	3
Greek yougurt	fat free, plain	½ cup (112 g)	60	5 g	80	4
ice cream	regular	½ cup (66 g)	137	16 g	50	8
ice cream, premium	French vanilla	½ cup (86 g)	191	19 g	47	9
milk, 2%	2% milk fat	1 cup (244 g)	122	12 g	82	10
milk, full fat	3.7% milk fat	1 cup (244 g)	156	11 g	73	8
milk, skim	skim, 0% fat	1 cup (245 g)	86	12 g	82	10
sherbert	orange	½ cup (74 g)	107	22 g	50	11
yogurt	low fat w/ sweetener	½ cup (114 g)	119	42 g	50	21
yogurt w/ fruit	strawberry, 1% fat	½ cup (114 g)	109	21 g	52	11

FRUITS						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
apple	medium, fresh	1 fruit	65	17	39	7
banana, ripe	medium, 7-8"	1 fruit	105	27	67	18
blackberries	fresh	1 cup	62	15	27	4
blueberries	fresh	1/2 cup (74 g)	42	11	25	3
canteloupe	fresh, med 5"	1/2 melon	93	23	65	15
cherries	sweet, raw, w/ pits	1 cup	87	22	32	7
dates, dried	pitted	2 fruits	132	36	42	15
grapefruit	fresh, 3 1/4"	1 fruit	104	27	25	7
grapes	red or green, fresh	1 cup	104	27	33	9
mango	fresh, sliced	1 cup	107	28	29	8
orange	medium	1 fruit	61	15	40	6
peach	fresh	4 oz	47	13	28	4
peach, light syrup	canned	4 oz	64	18	52	9
pineapple	fresh	4 oz	60	10	66	6
prunes	dried, pitted	2 oz	145	33	29	10
raisins	dried, seedless	2 oz	180	44	64	28
strawberries	fresh	4 oz	39	3	43	1
watermelon	fresh	4 oz	36	6	72	4

GRAINS						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
pearl barley	cooked	1 cup	193	44 g	43	19
quinoa	cooked	1 cup	222	39 g	46	18
rice, brown	med grain, cooked	1 cup (195 g)	218	46 g	48	22
rice, instant	cooked	1 cup (165 g)	193	44 g	67	29
rice, sticky	glutinous	1 cup (174 g)	169	37 g	49	18
rice, white	long grain, cooked	1 cup (158 g)	205	45 g	53	24
spelt	cooked	1 cup (194 g)	246	51 g	41	21
wheat germ	toasted, cereal	1 cup (113 g)	432	56 g	36	20

PASTA AND NOODLES						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
fettucini	cooked	1 cup	200	42 g	32	14
fusilli	cooked	1 cup	270	48 g	43	21
macaroni	cooked	1 cup (140 g)	221	43 g	45	23
macaroni & cheese	Kraft, cooked	1 cup	259	48 g	64	32
spaghetti , whole wheat	cooked	1 cup	174	37 g	41	15
spaghetti, angel hair	cooked	1 cup	210	41 g	45	19
spaghetti, gluten free	cooked	1 cup (140 g)	176	39 g	38	17
spaghetti, regular	enriched, cooked	1 cup	220	43 g	53	23

SNACK FOODS						
FOOD ITEM	FORM	SERVING SIZE	CALORIES	CARBS	GLYCEMIC INDEX	GLYCEMIC LOAD, STANDARD SERVING
chocolate chip	McDonald's	1 cookie (60 g)	160	25 g	64	16
chocolate, baking	unsweetened	41 g	205	12 g	0	0
chocolate, dark	bar, 60-69% cacao	1.5 oz, (41 g)	190	25 g	44	11
chocolate, milk	Hersheys, bar	1.5 oz, 43 g	220	25 g	57	14
Fruit Roll-Ups	General Mills, berry	14 g	52	12 g	67	8
graham cracker	Nabisco	2 sheets (28 g)	119	21 g	67	14
M & Ms	bag	1.7 oz, 48 g	240	34 g	68	23
M & Ms, peanut	bag	1.7 oz, 49 g	250	30 g	33	10
Oreos	Nabisco	3 cookies	160	25 g	64	16
popcorn	prepared with oil	2 cups (18 g)	62	12 g	72	7
potato chips	plain, salted	1½ oz (42 g)	235	21 g	48	10
pretzels	hard, salted	1½ oz (42 g)	163	34 g	67	23
rice cakes	cracker	1 oz	112	21 g	80	17
short bread	1⅝" cookie	2 pieces	80	10 g	60	6
Snickers	bar	52.7 g	250	33 g	68	22
tortilla chips, corn	yellow or white	1.5 oz (43 g)	207	29 g	58	17
Triscuits, plain	Nabisco	6 crackers (28 g)	120	20 g	70	14
Wheat Thins	Nabisco	16 crackers	140	22 g	67	15

VEGETABLES						
FOOD ITEM	**FORM**	**SERVING SIZE**	**CALORIES**	**CARBS**	**GLYCEMIC INDEX**	**GLYCEMIC LOAD, STANDARD SERVING**
bagel, plain	NY style	3.3 oz	289	56 g	69	39
baked potato, plain	no skin	1 large (300 g)	280	64 g	46	30
beets	fresh, boiled	½ cup (85 g)	37	8 g	38	3
bell peppers	red, raw	1 oz	9	2 g	50	1
boiled white potato	no skin	1 large (300 g)	258	60 g	43	26
carrots	baby	100 g (3.5 oz)	33	7 g	29	2
cucumber	w/ peel, raw	½ cup	8	2 g	53	1
french fries	McDonalds	med (4 oz)	370	46 g	48	22
green (snap) beans	fresh, cooked	1 cup (125 g)	44	10 g	40	4
green peas	fresh, raw	4 oz	90	16 g	49	8
lima beans	canned	3 oz	66	13 g	38	5
mashed potato	w/ milk, margerine	1 cup (210 g)	237	35 g	46	16
mashed potato, instant	w/ milk, margerine	1 cup (210 g)	244	34 g	44	15
onions	sweet, raw	1 oz	9	2 g	20	1
sweet potato	cooked	1 med (114 g)	105	24 g	42	10
tomatoes	red, ripe	3 oz (1 small)	16	3.5 g	29	1
yam	cooked	1 cup (136 g)	155	37 g	41	15
zucchini	fresh, cooked	½ cup (90 g)	14	4 g	25	1

MISC.						
FOOD ITEM	**FORM**	**SERVING SIZE**	**CALORIES**	**CARBS**	**GLYCEMIC INDEX**	**GLYCEMIC LOAD, STANDARD SERVING**
croutons	seasoned	1 oz	130	18 g	61	11
honey	pure	25 g	76	21 g	58	12
hummus, plain	Sabra	1 oz	70	4 g	25	1
pizza, cheese Pizza Hut	Personal Pan	6"	620	69 g	50	35
pizza, Supreme	slice	1 slice	290	26 g	36	9

APPX B: FATS & OILS CHART

FATS/OILS											
TYPE	1 TBS (g)	CALORIES	SAT FAT (%)	SAT FAT (g)	MUFA (%)	MUFA (g)	PUFA (%)	PUFA,(g)	OMEGA-6, mg	OMEGA-3, mg	OMEGA-6:3 RATIO
almond	13.6	120	8	1.1	70	9.5	17	2.4	2367	1	1987
avocado	14.0	124	12	1.6	74	9.9	14	1.9	1754	103	17.03
butter	14.2	102	69	7.3	31	2.3	4	0.4	387	45	8.6
canola	14.0	124	8	1.0	61	8.9	28	3.9	2610	1280	2.06
coconut	13.7	117	92	11.8	6	0.8	2	0.2	247	62	3.98
corn	13.6	122	13	1.8	25	3.8	57	7.4	7277	158	46.09
flax	13.6	120	9	1.2	13	2.5	71	9.2	1727	7249	0.24
grapeseed	13.6	120	10	1.3	16	2.2	70	9.5	9464	14	685.91
hazelnut	13.6	120	7	1.0	78	10.6	10	1.4	1249	1	1374
lard	12.8	115	41	5.0	48	5.7	12	1.4	1305	128	10.2
olive	13.5	119	14	1.9	77	9.9	9	1.4	1318	103	12.8
palm	13.6	120	40	6.7	48	5.0	10	1.3	1238	27	45.85
peanut	13.5	119	18	2.3	49	6.2	34	4.3	4321	131	32.98
rice bran	13.6	120	20	2.7	39	5.3	35	4.8	4543	218	20.8
safflower	13.6	120	10	0.8	13	2.0	78	10.1	1952	25	78.08
salmon	13.6	123	20	2.7	29	3.9	40	5.5	210	4802	0.04
sesame	13.6	120	15	1.9	42	5.4	44	5.7	5617	41	137.67
soy	13.6	120	15	2.1	25	3.1	60	7.9	6790	949	7.15
sunflower	13.6	120	11	1.4	21	2.7	68	8.9	8936	130	68.74
walnut	13.6	120	10	1.3	24	3.1	66	8.6	7194	1415	5.08

NUTS AND SEEDS								
TYPE	PORTION	CALORIES	SAT FAT	MUFA	PUFA	OMEGA-6	OMEGA-3	OMEGA-6:3 RATIO
almonds, blanched	1 oz	165	1.1 g	9 g	3.4 g	3,375 mg	25 mg	135
cashews	1 oz	163	2.6 g	7.6 g	2.2 g	2,145 mg	45.1 mg	47.56
chia seed	1 oz	137	0.9 g	0.6 g	6.5 g	1,620 mg	4915 mg	0.33
flax seed	1 oz	151	1.0 g	2.1 g	8.0 g	1,655 mg	6388 mg	0.26
hazel nuts, dried	1 oz	179	1.3 g	12.8 g	2.2 g	2,193 mg	24.4 mg	89.88
macadamia nuts, raw	1 oz	204	3.4 g	16.5 g	0.4 g	363 mg	57.7 mg	6.29
peanuts, dry roasted	1 oz	160	1.9 g	6.9 g	4.4 g	4,393 mg	0.8 mg	>1000
peanuts, oil roasted	1 oz	170	1.5 g	7.3 g	4.3 g	4,250 mg	0.8 mg	>1000
pecans, oil roasted	1 oz	203	2.0 g	11.5 g	6.6 g	6,314 mg	289 mg	21.85
pistachios, raw	1 oz	158	1.5 g	6.5 g	3.8 g	3,696 mg	71.1 mg	51.98
sunflower kernels, roasted	1 oz	168	2.0 g	2.3 g	9.6 g	9,581 mg	21 mg	457.35
walnuts, English, dried	1 oz	185	1.7 g	2.5 g	13.2 g	10,666 mg	2542 mg	4.2

PLANT BASED								
TYPE	PORTION	CALORIES	SAT FAT	MUFA	PUFA	OMEGA-6	OMEGA-3	OMEGA-6:3 RATIO
avocado, 1, small	3.5 oz	160	2.2 g	9.8 g	1.9 g	1698 mg	111 mg	15.3
corn, yellow	1 cup	132	0.3 g	0.5 g	0.9 g	835 mg	24.6 mg	33.94
kale, raw	1 cup (67 g)	33	0.1 g	0 g	0.2 g	92.4 mg	121 mg	0.76
spinach, raw	1 cup (30 g)	7	0.02 g	0 g	0.05 g	7 mg	40 mg	0.19

FISH AND SEAFOOD								
TYPE	PORTION	CALORIES	SAT FAT	MUFA	PUFA	OMEGA-6	OMEGA-3	OMEGA-6:3 RATIO
amari/squid, fried	4 oz	199	2.2 g	3.0 g	2.4 g	1665 mg	733	2.27
cod, dry cooked	4 oz	120	0.13 g	0.13 g	0.40 g	9 mg	323	0.03
crab, dungeness	4 oz	124	0.23 g	0.23 g	0.45 g	0	462 g	0
mackerel, dry cooked	4 oz	152	0.5 g	1.1 g	0.7 g	58 mg	479	0.12
red snapper, dry cooked	4 oz	145	0.4 g	0.33 g	0.67g	28 mg	389	0.07
salmon, Chinnok, smoked	4 oz	133	1.1 g	2.3 g	1.2 g	535 mg	593	0.9
salmon, Coho, dry cooked	4 oz	160	1.8 g	3.3 g	1.8 g	335 mg	1,219.00	0.3
salmon, sockeye, dry cooked	4 oz	157	1.2 g	1.8 g	1.5 g	64 mg	1,263.00	0.05
sardines, in oil, drained	4 oz	236	1.75 g	4.41 g	5.9 g	4,018 mg	3058 mg	2.39
shrimp, boiled	4 oz	112	0.27 g	0.27 g	0.53 g	24 mg	394	0.06
slops, steamed	4 oz	124	0.1 g	0.1 g	0.6 g	8 mg	444	0.02
tilapia, dry cooked	4 oz	144	1.0 g	1.1 g	0.7 g	340 mg	272	1.25
trout, dry cooked	4 oz	216	1.6 g	4.8 g	2.2 g	254 mg	1,553.00	0.16
whiting, dry cooked	4 oz	132	0.45 g	0.45 g	0.68 g	23 mg	621	0.07

MEATS								
TYPE	PORTION	CALORIES	SAT FAT	MUFA	PUFA	OMEGA-6	OMEGA-3	OMEGA-6:3 RATIO
bacon, fried	2 slices	86	2.2 g	3.0 g	0.8 g	31 mg	32	0.97
chicken, breast, roasted	4 oz	187	1.1 g	1.4 g	0.9 g	669 mg	79.4	8.43
chicken, dark meat, roasted	4 oz	232	3.0 g	4.1 g	2.6 g	2,121 mg	204	10.39
hamburger 85%, pan cooked	4 oz	263	6.0 g	6.8 g	0.5 g	390 mg	51	7.64
pork, leg, lean, roasted	4 oz	240	3.8 g	5.0 g	0.9 g	873 mg	22.7	38.48
top sirloin, ⅛" fat trim, broiled	4 oz	186	4.3 g	4.5 g	0.4 g	282 mg	97	2.89
turkey, breast, roasted	4 oz	153	0.3 g	0.1 g	0.3 g	169 mg	26	6.5
turkey, dark meat, roasted	4 oz	184	1.6 g	1.1 g	1.5 g	1,191 mg	102	11.67

DAIRY								
TYPE	PORTION	CALORIES	SAT FAT	MUFA	PUFA	OMEGA-6	OMEGA-3	OMEGA-6:3 RATIO
buttermilk, cultured	8 oz	137	3.0 g	1.4 g	0.2 g	98 mg	73.5	1.33
cheese, American	1 oz (1 slice)	107	5.6 g	2.5 g	0.3 g	172 mg	109	1.59
cheese, cheddar	1 oz	114	6.0 g	2.7 g	0.3 g	164 mg	104	1.58
cheese, mozarella	1 oz	85	3.7 g	1.9 g	0.2 g	111 mg	106	1.06
cheese, Swiss	1 oz	108	5.1 g	2.1 g	0.3 g	176 mg	100	1.76
Greek yogurt, plain	4 oz	98	3.8 g	0	0	0	0	0
ice cream, vanilla, premium	½ cup	266	11.1 g	4.8 g	0.7 g	468 mg	243	1.93
milk, 2% fat	8 oz	122	3.1 g	1.4 g	0.2 g	151 mg	19.5	7.74
milk, whole	8 oz	146	4.6 g	2.0 g	0.5 g	293 mg	183	1.6
yogurt, whole milk, plain	4 oz	74	2.6 g	1.1 g	0.1 g	80 mg	33.1	2.4

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Genetic research is an ongoing process and is not comprehensive. While MOLECULAR™ uses up-to-date, standardized methods to test and utilizes the latest research to interpret your genetics, there is much still unknown about genetics. In the future, the scientific community may show previous research to be incomplete or inaccurate. Scientific research on genetics is rapidly growing and as it evolves, it may change the interpretation of the results in this report.

Despite best efforts, some samples may not be able to be processed or the laboratory testing process may result in errors. MOLECULAR™ is a CLIA certified and College of American Pathologists (CAP) accredited testing laboratory that has detailed and effective procedures in place to protect against testing errors. However, errors may still occur. Problems arising from the testing may include but are not limited to mislabeling of specimens, the

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Even for processing that meets our high standards, it may not be possible to interpret the data generated from the laboratory testing process on a small unknown fraction of the data generated or an incorrect result may be generated. These are referred to as "Errors". As this possibility is known in advance, users are not entitled to refunds where these errors occur but MOLECULAR™ will work with the client to correct these errors if possible and provide useful results. This may include shipping out a collection kit for the recollection of the specimens if the error is through no fault of the client.

Testing for the specific genetic variations/mutations on the listed genes is performed using PCR with allele-specific probes. Test results do not rule out the possibility that an individual could be a carrier of other variations not detected by this gene variation panel. Also, rare mutations may occur on the gene near the alleles tested and this may affect the ability to detect variations on the original alleles.

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