

Fitness Results

TRAIT NAME	YOUR RESULTS	POSSIBLE OUTCOMES
Endurance Genetic variations in endurance ability		Average: Likely to be average at endurance activities
		Excellent: Likely to be excellent at endurance activities
	✓	Good: Likely to be good at endurance activities
Aerobic Capacity Genetic variations in aerobic capacity	✓	Average: Likely to have average aerobic capacity
		Excellent: Likely to have excellent aerobic capacity
		Good: Likely to have good aerobic capacity
Heart Capacity Genetic variations in heart capacity		Average: Likely average heart capacity
		Excellent: Likely excellent heart capacity
	✓	Good: Likely good heart capacity
Lung Capacity Genetic variations in lung capacity	✓	Average: Likely average lung capacity
		Excellent: Likely excellent lung capacity
		Good: Likely good lung capacity
Power Genetic variations in power performance		Average: Likely to be average at power based activities
		Excellent: Likely to be excellent at power based activities
	✓	Good: Likely to be good at power based activities
Hand Grip Strength Genetic variations in hand grip strength		Average: Likely average hand grip strength
		Excellent: Likely excellent hand grip strength
	✓	Good: Likely good hand grip strength
Flexibility Genetic variations in flexibility		Average: Likely to have moderate flexibility
	✓	Decreased: Likely to have decreased flexibility
		Increased: Likely to have enhanced flexibility
Tendon Strength Genetic variations in tendon strength		Average: Likely average tendon strength
		Excellent: Likely excellent tendon strength
	✓	Good: Likely to have good tendon strength
Ligament Strength Genetic variations in ligament strength	✓	Average: Likely average ligament strength
		Excellent: Likely excellent ligament strength
		Good: Likely good ligament strength

TRAIT NAME	YOUR RESULTS	POSSIBLE OUTCOMES
Exercise Motivation Genetic variations in exercise motivation	✓	Average: Moderate inclination towards exercise
		Excellent: Highly inclined to exercise with positive mood changes
		Good: Inclined to exercise with positive mood changes
Likelihood Of Injury Genetic variations in the likelihood of injury		Average: Likely average risk for exercise related injuries
	✓	Lower: Low likelihood of injury
		Higher: Likely more exercise related injuries
Likelihood Of Fatigue Genetic variations in the likelihood of fatigue		Average: Likely to sustain exercise for a moderate duration
		Lower: Likely to sustain exercise for longer durations
	✓	Higher: Likely to sustain exercise for shorter durations
Exercise Recovery Genetic variations in exercise recovery	✓	Average: Likely to have average period of recovery
		Slower: Likely to experience prolonged recovery
		Faster: Likely to experience rapid recovery
HDL Cholesterol Levels With Exercise Genetic variations in HDL levels with exercise	✓	Average: Moderate increase in HDL levels with exercise
		Favorable: Significant increase in HDL levels with exercise
Insulin Sensitivity With Exercise Genetic variations in insulin sensitivity with exercise		Average: Moderately improved insulin sensitivity with exercise
	✓	Favorable: Enhanced insulin sensitivity with exercise
Weight Loss Or Weight Gain With Exercise Genetic variations in weight gain or loss with exercise	✓	Average: Likely to experience moderate weight loss
		Unfavorable: May not experience much weight loss
		Favorable: Likely to experience higher weight loss

1. ENDURANCE

Good: Likely to be good at endurance activities

Endurance is the body's capacity to utilize oxygen for energy production and sustain it for a prolonged duration of physical activity. A high endurance individual can sustain an activity for a prolonged duration, with minimal discomforts like breathlessness and fatigue. We have analyzed genes that influence endurance aspects such as the type of fuel used by the cells for energy production, percentage distribution of muscle fibers (slow twitch and fast twitch) and the adaptability of the blood vessels to carry more oxygen. People of certain genetic types are better at endurance based activities than others.

Recommendation:

- **ACTIVITIES** : Medium intensity workouts like jogging, running, strength training with moderate weights and more repetitions can be performed for longer durations.

- **NUTRIENTS**: Manganese (Mussels (Seafood), Hazelnuts, Pumpkin Seeds, Cloves, Whole Wheat Bread), Magnesium (Pumpkin seeds, Almonds, Mackerel, Spinach, Lima Beans), Zinc (Oyster, Beef/Lamb, Pumpkin seeds/Squash seeds, Cocoa powder, Cashew nuts), Iron (Spirulina, Oysters, Beef/Liver, Apricot, Spinach) and Potassium (dried apricots, salmon, potato/sweet potato, avocado, spinach).

Genes analyzed: *ACTN3, PPARA, L3MBTL4, ACE, ZNF429, PPC3B, ACOXL, CRP, IL15RA, ADRB1, VEGFR2, ADRB3, BDKRB, CKMM, NFIA-AS2, COL5A1, CPQ, ADRB2, PPARGC1A, COL6A1, UCP2, AQP1, VEGFA, AGTR2, PPARGC1A1, GABPB1, UCP3, GALM, GNB3, GRM3, HFE, HIF1A, SGMS1, PPARD, HIF2A, SOD2, TPK1, ITPR11, KCNJ11, PPARD1, NATD1, GABPB11, HIF2A1, ADRB21*

2. AEROBIC CAPACITY

Average: Likely to have average aerobic capacity

Aerobic capacity (VO₂ max) is the maximum capacity of our body to transport and utilize oxygen during exercise and is partially genetically influenced. During exercise, muscles work harder than at rest and, therefore, need more energy. The ATP energy required by the muscles is produced with the help of oxygen. This is the reason why there is progressive increase in breathing when the intensity of exercises increases. The body needs more oxygen to produce the necessary ATP energy for muscle movement. People of certain genetic types differ in the level of oxygen uptake during exercise.

Recommendation:

- **ACTIVITIES** : Mild to moderate intensity exercises like brisk walking, alternate jogging, moderate swimming can be performed. VO₂ max can improve with gradual and progressive training.

- **NUTRIENTS** : Iron (spirulina, oysters, beef/liver, apricot, spinach), Magnesium (pumpkin seeds, almonds, mackerel, spinach, lima beans) and Ubiquinol (Coenzyme Q10-peanuts, chicken, spinach, avocado, broccoli)

Genes analyzed: *ADRB2, PPARGC1A, VEGFA, PPARA*

3. HEART CAPACITY

Good: Likely good heart capacity

Heart Capacity is the ability of the heart to increase cardiac output to meet increased needs for oxygen during physical activity or exercise. Cardiac capacity is a combination of the physical condition of the heart and aerobic fitness level. People of certain genetic types have better heart capacity than others.

Recommendation:

- **ACTIVITIES** : May require less time to adjust to exercises. Aerobic training can improve heart capacity over time.

Genes analyzed: *CREB1, NOS3, NPY*

4. LUNG CAPACITY

Average: Likely average lung capacity

Total lung capacity, or TLC, refers to the total amount of air in the lungs after taking the deepest breath possible. People of certain genetic types have higher lung capacity than others.

Recommendation:

- **ACTIVITIES** : May experience average lung capacity, so the intensity of exercises should be increased gradually. More likely to feel 'short of breath' easily. Aerobic training can increase lung capacity over time

Genes analyzed: *ADRB1, APOE1, APOE*

5. POWER

Good: Likely to be good at power based activities

Power is the rapid burst of energy observed during high intensity activities of shorter duration. Type II or fast twitch muscle fibers allow us to perform rapid, high intensity movements. The ability of blood vessels to constrict and make oxygen utilization more efficient is also important for power. We have analyzed genes that influence the percentage distribution of muscle fibers (slow twitch and fast twitch) and their ability to exert maximal power over a short period of time. People of certain genetic types are better at power based activities than others.

Recommendation:

- **ACTIVITIES** : High intensity exercises including sprinting, cycling, high intensity interval training, cross fit training, strength training with heavy weights and fewer repetitions can be performed.
- **NUTRIENTS**: Caffeine (maximum 400mg/day). Slow metabolizers of caffeine should not consume above 100mg/day

Genes analyzed: *EPAS1, PPARG, SLC16A1, ACTN3, RC3H1, AGT, GPC5, ADRB2, SUCLA2, AGTR2, AMPD1, COTL1, HSD17B14, IP6K3, HIF1A, IGF1, EPAS11, CRP, TPK1, VDR2, MTHFR, MPRIP, TRHR, CREM, NOS3, IL6, WAPAL, UCP2, PPARA, MTRR, ADRB21, VDR1, CKM, MTR*

6. HAND GRIP STRENGTH

Good: Likely good hand grip strength

Muscle strength, measured by hand grip strength, is an accessible and widely used proxy of muscular fitness. Hand grip strength is associated with frailty and risk of fracture. People of certain genetic types have a better hand grip strength than others.

Recommendation:

- **ACTIVITIES** : Expected to have good hand grip strength. Resistance training can increase muscle strength over time.

Genes analyzed: *UCP3, HOXB3, PEX14, GBF1, ERP27, SLC8A1, KANSL1, MGMT, LRPPRC*

7. FLEXIBILITY

Decreased: Likely to have decreased flexibility

Flexibility is the ability of your joints and muscles to move freely (Range of motion). It is important in fitness because it allows for better range of movement when playing sports or exercising. Flexibility is attributed to the protein collagen and the extracellular matrix that surrounds the cells. We have analyzed the genes that could potentially influence your flexibility and performance by influencing composition of ligaments and tendons. People of certain genetic types have better flexibility when compared to others.

Recommendation:

- **ACTIVITIES** : Extensive stretching exercises and warmups are recommended before exercise sessions. Decreased flexibility has been associated with better running performance.

- **NUTRIENTS**: Ascorbic acid (guava, kiwi, black currant, red bell pepper, orange), Anthocyanidins (black raspberries, eggplant/brinjal, blackcurrant, blue berries, black berries), Methionine (brazil nuts, lean beef and lamb, turkey and chicken, fish and shell fish (tuna), soybeans), Cysteine (soya, beef/lamb, sunflower seeds, chicken/turkey, oats and oats bran) and Taurine (mackerel, chicken liver, crab, lamb, beef liver)

Genes analyzed: *COL5A1, ACTN3*

8. TENDON STRENGTH

Good: Likely to have good tendon strength

Tendons and ligaments are dense connective tissues made of collagen or elastin fibers that run parallel to each other, creating strong cords. A tendon is a band of fibrous connective tissue which connect muscle to tenocytes, increasing their tensile strength. People of certain genetic types have a better tendon strength than others.

Recommendation:

- Likely good tendon strength. Resistance training can increase tendon strength over time.

Genes analyzed: *MMP3, MMP31, MMP32, COL5A11, GDF5, COL1A1, COL5A1*

9. LIGAMENT STRENGTH

Average: Likely average ligament strength

Tendons and ligaments are dense connective tissues made of collagen or elastin fibers that run parallel to each other, creating strong cords. Ligaments connect bone to bone to form joints -- such as knees, elbows, hips and ankles. People of certain genetic types may have stronger ligaments than others.

Recommendation:

- **ACTIVITIES** : Resistance training helps in increasing ligament strength. Warming up before resistance training is recommended

Genes analyzed: *COL1A1, CILP, COL5A1*

10. EXERCISE MOTIVATION

Average: Moderate inclination towards exercise

Certain individuals readily take up physical activity, while others lack the motivation for it. Neurochemicals produced by the body in response to exercise influence how much we get habituated to physical activity and hence are motivated to repeat it again and again. People of certain genetic types take to physical activity more readily than others.

Recommendation:

- **ACTIVITIES** : May find it hard to develop the habit of regular exercise. Group exercises, gym buddies, dancing, sports and other fun physical activities are some ways to overcome this.

Genes analyzed: *BDNF*

11. LIKELIHOOD OF INJURY

Lower: Low likelihood of injury

Sportsmen and runners who place stress on the Achilles tendon have the greatest likelihood of muscle injury and tendinopathy. The Achilles tendon connects your calf muscles to your heel bone. Tendinopathy refers to injury to the tendon. People of certain genotypes are more prone to injury than others and are at increased risk of tendinopathy and other related injuries.

Recommendation:

- **ACTIVITIES** : May engage in any activity of your choice.

- **NUTRIENTS**: Alpha linolenic acid, Eicosapentaenoic acid (flaxseed oil, fish oil (salmon), chia seeds, walnuts and walnut oil, caviar), Docosahexaenoic acid (salmon, sardines, mackerel, beef, flaxseed)

Genes analyzed: *COL5A1, MCT1, MMP3*

12. LIKELIHOOD OF FATIGUE

Higher: Likely to sustain exercise for shorter durations

Do you normally feel excessively tired after exercise? If yes, the answer to this may be in the expression of certain genes in your body. Lactate is the preferred source of fuel for energy production in the exercising muscle when there is a lack of oxygen (anaerobic metabolism). When muscles use up energy during physical activity, there is lactate build-up, which can lead to muscle fatigue. Apart from this, exercise-induced rise in inflammation and sub-optimal flexibility could also be contributing factors for muscle fatigue. People of certain genetic types have better flexibility than others.

Recommendation:

- **ACTIVITIES** : You are likely to sustain physical activity of your choice for shorter durations. Take sufficient breaks between sets before continuing.
- **NUTRIENTS**: Hydroxy methyl butyrate (grapefruit, alpha alpha, cat fish, avocado), Manganese (mussels (seafood), hazelnuts, pumpkin seeds, cloves, whole wheat bread) and Ascorbic acid (Vitamin C- guava, kiwi, black currant, red bell pepper, orange)

Genes analyzed: *TNF, MCT1*

13. EXERCISE RECOVERY

Average: Likely to have average period of recovery

The process of exercise causes inflammation and minor tissue damage. During rest periods, the body heals and recovers from this damage. People of certain genetic types recover quickly, while others require longer periods, which influences the frequency of exercise, rehab intensity and supplementation needs.

Recommendation:

- **ACTIVITIES** : Moderate resting periods between sessions may be required.
- **NUTRIENTS**: Curcumin, Polyunsaturated fatty acids (soybean oil, corn oil, walnuts, salmon, pine nuts), Glucosamine (shrimp with shell, lobster with shell, crab with shell, crawfish, bone broth)

Genes analyzed: *TNF, SOD2*

14. HDL CHOLESTEROL LEVELS WITH EXERCISE

Average: Moderate increase in HDL levels with exercise

Regular exercise helps in increasing your HDL cholesterol levels. People of certain genetic types experience a greater increase in HDL levels than others.

Recommendation:

- **ACTIVITIES** : Regular exercise may moderately improve your HDL levels.
- **NUTRIENTS**: Folate (beans, lentils, spinach, lettuce, broccoli), Omega 3-fatty acids (flaxseed oil (cold pressed), salmon fish oil, chia seeds, walnuts, mackerel), Niacin (tuna, chicken breast, peanuts, sunflower seeds, mushrooms), Fibre rich diet (one bran cereal, amaranth grain, white beans cooked, sesame seeds, fig dried)

Genes analyzed: *PPARD*

15. INSULIN SENSITIVITY WITH EXERCISE

Favorable: Enhanced insulin sensitivity with exercise

Exercise generally improves your insulin sensitivity. People of certain genetic types experience greater improvements than others.

Recommendation:

- **ACTIVITIES** : Regular exercise may significantly improve your insulin sensitivity.
- **NUTRIENTS**: Lipoic acid (chia seeds, flaxseeds, red meat, beets, spinach), Magnesium (pumpkin seeds, almonds, mackerel, spinach, lima beans), Polyunsaturated fatty acids (soybean oil, corn oil, walnuts, salmon, pine nuts), Resveratrol (red grapes, boiled peanuts, dark chocolate/ cocoa powder, berries, pistachios) and Vitamin D (crimini mushrooms, salmon, fortified breakfast cereal, fortified tofu, eggs)

Genes analyzed: *LIPC*

16. WEIGHT LOSS OR WEIGHT GAIN WITH EXERCISE

Average: Likely to experience moderate weight loss

Regular exercise aids in weight management via improved metabolism. People of certain genetic types may benefit more than others in terms of weight loss in response to exercise.

Recommendation:

- **ACTIVITIES** : Likely to lose moderate weight upon taking up regular exercise. Continue to exercise, additionally, focus on dietary means to further reduce weight.
- **NUTRIENTS**: Chitosan (outer shells of crab, outer shells of crayfish, outer shells of shrimp, outer shells of squid), Synephrine (Bitter Orange), Conjugated linolenic acids (Grass Fed Cow's Whole Milk, Grass Fed Cow's Cheese, Grass Fed Beef, Cheddar Cheese, Safflower Oil), Pyruvate (red apple, cheese, dark beer, red wine), Fucoxanthin (brown seaweed), Hydroxycitric acid (garcinia cambogia, lemon, grape fruit, orange), Glucomannan (konjac root, shirataki noodles, pasta)

Genes analyzed: *FTO, INSIG2, ADRB2*