

APOE

Fatty Acid Sensitivity

Adapt

Normal

Normal

TT	CC	CT
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Your Result: Normal

This gene is involved in controlling lipid and cholesterol metabolism from your diet. This result is the most commonly found variant found in 75% of the population. Studies have shown that people with CT or CC tend to have normal fat storage and metabolism.

People with this result trying to add mass quickly will find it more difficult than people with TT. For this result less repetitive higher power workouts are necessary to add mass.

Consider working with a certified personal trainer and consult your physician before undertaking any new exercise programs.

Comments:

The APOE gene encodes a protein called Apolipoprotein E that is involved in cholesterol regulation and lipid metabolism. Genetic polymorphisms related to the APOE gene have been shown to affect weight gain. Analysis determines if a person is likely to easily gain weight or is considered average.

References: APOE Genotype and Cardio-Respiratory Fitness Interact to Determine Adiposity in 8-Year-Old Children from the Tasmanian Infant Health Survey Justine A. Ellis , Anne-Louise Ponsonby, Angela Pezic, Elizabeth Williamson, Jennifer A. Cochrane, Joanne L. Dickinson, Terence Dwyer Published: November 1, 2011DOI: 10.1371/journal.pone.0026679.

1) Zhen J, et al., ApoE rs429358 and rs7412 Polymorphism and Gender Differences of Serum Lipid Profile and Cognition in Aging Chinese Population, Front Aging Neurosci. 2017 Aug 2;9:248.

2) Yuan L, et al., The relationship between genetic polymorphisms in apolipoprotein E (ApoE) gene and osteonecrosis of the femoral head induced by steroid in Chinese Han population. Genes Genomics. 2018 Feb;40(2):225-231.

APOE

Age Related Metabolism

Adapt

Normal

Gifted

CC	TT	CT
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Your Result: Gifted

This gene has a role in your metabolism of lipids and cholesterol from your diet. This result is rare. People with this result may have an advantage with bone maintenance and normal fat metabolism. Studies have shown that with this result people are better able to maintain normal fat and bone density with aging. In addition to balancing nutrition to ensure you are maintaining healthy vitamin D and calcium levels. Sustained exercise has been shown to reduce age related metabolism decline.

Consider working with a certified personal trainer and consult your physician before undertaking any new exercise programs.

Comments:

The APOE gene encodes a protein involved in cholesterol regulation and lipid metabolism. Genetic polymorphisms related to the APOE gene have been shown to affect aging, fragility and physical fitness. Analysis determines if a person should increase activity levels to counter the effects of aging.

References: Novelli V1, Viviani Anselmi C, Roncarati R, Guffanti G, Malovini A, Piluso G, Puca AA, "Lack of replication of genetic associations with human longevity." Biogerontology 2008 Apr;9(2):85-92.

1) Zhen J, et al., ApoE rs429358 and rs7412 Polymorphism and Gender Differences of Serum Lipid Profile and Cognition in Aging Chinese Population, Front Aging Neurosci. 2017 Aug 2;9:248.

2) Yuan L, et al., The relationship between genetic polymorphisms in apolipoprotein E (ApoE) gene and osteonecrosis of the femoral head induced by steroid in Chinese Han population. Genes Genomics. 2018 Feb;40(2):225-231.

APOa2

Lipid Metabolism

Adapt

Normal

Normal

GG	AA	AG
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Your Result: Adapt

This result is the most common and found in about 60% of the population. This gene is involved in the metabolism of lipids and cholesterol from your diet. Studies have shown that people like you with this result may have an increased sensitivity to saturated fat relative to the AG and AA results.

Comments:

The APOa2 gene encodes a protein called Apolipoprotein A-II that is involved in cholesterol regulation and lipid metabolism. Genetic variations related to the APOa2 gene have been shown to affect food metabolism. Analysis determines if a person is likely sensitive to saturated fatty acids or is considered average.

References: Smith CE, Tucker KL, Arnett DK, Noel SE, Corella D, Borecki IB, Feitosa MF, Aslibekyan, Parnell, LD, Lai CQ, Lee YC, Ordovas JM, "Apolipoprotein A2 Polymorphism Interacts with Intakes of Dairy Foods to Influence Body Weight in 2 U.S. Populations." Journal of Nutrition 2013L 143(12): 1865-1871.

1) Bandarian F, et al., Identification of Sequence Variation in the Apolipoprotein A2 Gene and Their Relationship with Serum High-Density Lipoprotein Cholesterol Levels, Iran Biomed J. 2016;20(2):84-90.

2) Corella D et al., APOA2, Dietary Fat and Body Mass Index: Replication of a Gene-Diet Interaction in Three Independent Populations., Arch Intern Med. 2009 Nov 9; 169(20): 1897–1906.

FABP2

Fat Processing Ability

Adapt

Adapt

Normal

CT

TT

CC

Your Result: Adapt

This result is almost as common as CC and found in 40% of the population. People like you tend to have moderate to high sensitivity to saturated fats with less ability to metabolize fat consumed. Studies have shown that the risk of obesity is higher for people with CT than people with CC.

Comments:

The FABP2 gene encodes for the protein called fatty acid binding protein. This form of the protein has a role in transporting fatty acids particularly in our intestines to control the processing of the fats that we eat. Genetic polymorphisms of FABP2 are associated with how well we process the fats from our diet. This gene is associated with our sensitivity to fatty acids and risk of obesity.

References: Liu Y, Wu G, Han L, Zhao K, Qu Y, Xu A, Huang Q, "Association of the FABP2 Ala54Thr polymorphism with type 2 diabetes, obesity, and metabolic syndrome: a population-based case-control study and a systematic meta-analysis." *Genetics and Molecular Research* 2015 Feb 6;14(1):1155-68.

FADS1

Fatty Acid Response

Adapt

Adapt

Gifted

CT

TT

CC

Your Result: Adapt

This is a common result found in 43% of the population. The appearance of a "T" indicates you may have higher cholesterol levels than the recommended levels. You may want to check with your Doctor on your blood cholesterol levels and adjust your diet to support healthy cholesterol levels.

Comments:

Scientists have found that variants in this gene can cause individual to have higher cholesterol levels than normal. Regulation of our HDL, LDL, and triglyceride levels are important to our cholesterol levels, inflammation and health.

References: Hellstrand S, Sonestedt, Ericson E, Gullberg B, Wirfalt E, Hedblad B, and Orho-Melander M, Intake levels of dietary long-chain PUFAs modify the association between genetic variation in FADS and LDL-C, *J Lipid Res.* 2012 Jun; 53(6): 1183–1189.

Merino DM, Johnston H, Clarke S, Roke K, Nielsen D, Badawi A, El-Sohemy A, Ma DW, Mutch DM, Polymorphisms in FADS1 and FADS2 alter desaturase activity in young Caucasian and Asian adults, *Mol Genet Metab.* 2011 Jun;103(2):171-8.

KCTD10

Cholesterol and Lipids

Adapt

Adapt

Normal

CC

CG

GG

Your Result: Normal

This is the major variant found in 57% of the population. With this type, you may have a lower LDL (bad cholesterol). Follow a nutrient dense diet rich in fruits and vegetables, balanced with quality carbohydrates, lean protein and healthy fat, to meet your needs.

Comments:

Your body's cholesterol is found in two forms, the LDL (low density lipoprotein) and HDL (high density lipoprotein). LDL is considered "bad" cholesterol and the one that contributes the most to heart disease due to its contribution to plaque, which can clog arteries and make them less flexible. HDL is considered "good" cholesterol and helps keep the LDL levels in check by removing it from the arteries. Our levels of HDL are largely controlled by our genetic code and are revealed in this genetic analysis.

PPAR γ

Monounsaturated Fat

Adapt

Adapt

Normal

CG

GG

CC

Your Result: Adapt

This is a rare result of this gene. People with this result may metabolize fat from the diet more poorly than people with CC. Studies have shown that people with this result may gain weight more easily. It is important to be mindful of the amount and type of fat you consume in your diet, to help prevent weight gain. Choose healthy fats in moderate amounts from nuts, seeds, oils, avocado and fish rich in omega-3 fatty acids. Limit or avoid fried foods and high-fat meat and dairy products. Consider working with a Registered Dietitian Nutritionist that can help you develop a meal plan that includes the right amount of fat to help aid in attaining or maintaining a healthy weight.

Comments:

The PPAR γ gene has a function in controlling the storage of fat in your body and your likelihood to gain weight. Through genetic analysis of this gene, it's possible to determine if an individual has a higher sensitivity to high fat diets and a greater likelihood of increased weight gain, due to this sensitivity.

References: Regieli JJ, Jukema JW, Doevendans PA, Zwindeman AH, van der Graaf Y, Kastelein JJ, Grobbee DE, "PPAR gamma variant influences angiographic outcome and 10-year cardiovascular risk in male symptomatic coronary artery disease patients." *Diabetes Care* 2009 May;32(5):839-44.

Hsiao TJ, Lin E., "The Pro12Ala polymorphism in the peroxisome proliferator-activated receptor gamma (PPARG) gene in relation to obesity and metabolic phenotypes in a Taiwanese population". *Endocrine*. 2015 Apr;48(3):786-93.

TCF7L2

Sugar Sensitivity

Adapt

Adapt

Normal

TT

CT

CC

Your Result: Normal

To see more, purchase our Metabolism or Nutrition DNA Test through the app or online at shop.orig3n.com.

You are part of about 61% of the population with the CC result. This genotype is associated with normal metabolism of sugar and no increased risk of weight gain. Even though you are not at risk for high sensitivity to sugar, you should still maintain a healthy and balanced diet.

Eat a variety of nutritious foods from all the food groups.

You may be eating right number of calories to maintain or lose weight, but your body may not be getting the nutrients it needs to be healthy. Nutrient-rich foods have minerals, protein, whole grains, vitamins and other nutrients but are lower in calories. These foods may help you control your weight, cholesterol levels and blood pressure as part of an overall healthy lifestyle. In general, strive to get 45%-55% of your calories from healthy carbohydrates (fruits, vegetables, and whole grains), less than 35% from fat, and 15% or more from protein (lean animal proteins, low-fat dairy, beans, nuts, seeds).

Eat an overall healthy diet that emphasizes the following foods.

- a variety of fruits and vegetables
- whole grains
- low-fat dairy products
- lean poultry, fish, and pork
- nuts and legumes
- healthy vegetable oils (olive, avocado, flaxseed or coconut)

Limit saturated fat, trans fat, sodium, red meat, sweets and sugar-sweetened beverages. If you choose to eat red meat, compare labels and select the leanest cuts available.

Eat less of the nutrient-poor foods.

The right number of calories to eat each day is based on your age and physical activity level and whether you're trying to gain, lose or maintain your weight. You could use your daily allotment of calories on a few unhealthy high-calorie foods and beverages, but you probably wouldn't get the nutrients your body needs to be healthy. Limit foods and beverages high in calories but low in nutrients.

As you make daily food choices, base your diet on these recommendations:

- Replace high-calorie foods with a variety fruits and vegetables. Increasing the amount of fiber in your diet from healthy fruits and vegetables also leads to a sense of fullness, helps to provide a healthy gut, and may reduce your hunger for less nutritional fatty and/or sugary foods.
- Choose fiber-rich whole grains for most grain servings (breads, flour, pasta and rice).
- Choose poultry, fish or pork without skin and prepare them in healthy ways without added saturated and trans fat. If you choose to eat red meat, look for the leanest cuts available and prepare them in healthy and delicious ways.
- Eat a variety of fish at least twice a week, especially fish containing omega-3 fatty acids (for example, salmon, trout and herring).
- Select fat-free (skim) and low-fat (1%) dairy products (milk, cheese, yogurt and butter).
- Limit saturated fat and trans-fat and replace them with the better fats, monounsaturated and polyunsaturated. If you need to lower your blood cholesterol, reduce saturated fat to no more than 5 to 6 percent of total calories. For someone eating 2,000 calories a day, that's about 13 grams of saturated fat.
- Cut back on beverages and foods with added sugars such soft drinks and sweets.
- Choose foods with less sodium and prepare foods with little or no salt. To lower blood pressure, aim to eat no more than 2,300 milligrams of sodium per day. Reducing daily intake to 1,500 mg is desirable because it can lower blood pressure even further. If you can't meet these goals right now, even reducing sodium intake by 1,000 mg per day can benefit blood pressure.
- If you drink alcohol, drink in moderation. That means no more than one drink per day if you're a woman and no more than two drinks per day if you're a man.
- It is also important to drink plenty of water each day both to help in feeling full, but also to maintain a healthy gut and digestive system.

One of the diets that fits the majority of these dietary recommendations is the DASH (Dietary Approaches to Stop Hypertension) put forth by the American Heart Association and the U.S. National Institute of Health. Because the DASH diet is a healthy way of eating, it offers health benefits besides managing weight including lowering blood pressure and helping to prevent osteoporosis, cancer, heart disease, stroke and diabetes.

Comments:

The TCF7L2 gene encodes for a protein called "transcription factor 7-like-2" which is involved in glucose, or sugar, metabolism in the body. Variants in this gene have been shown to decrease glucose-induced insulin production and therefore have an association with risk of developing Type II Diabetes. Incretins are released from pancreatic B-cells when sugar is consumed in order to lower blood glucose levels. The SNP that is tested here interacts with the incretin-release process and leads to a decrease in incretin response, although the exact mechanism is unknown. The changes to this gene lead those with the minor allele to be more sensitive to dietary sugars and may see higher than average weight gain after sugar consumption.