

Adipogenesis (Functional)

Biohacker Report

REPORT CATEGORY —



WEIGHT & BODY FAT

Sample Client

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DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

Personal information

NAME

Sample Client

SEX AT BIRTH

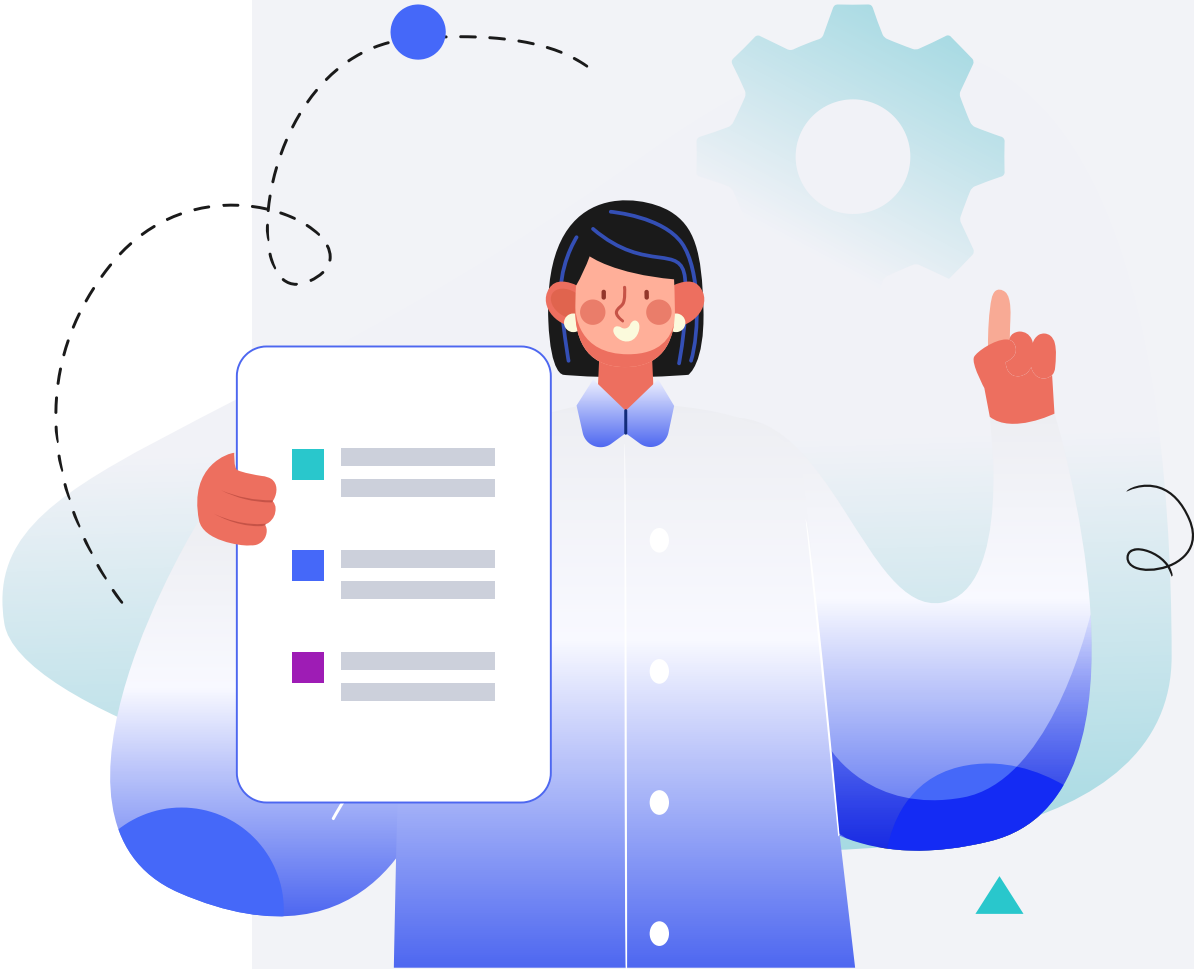
Male

HEIGHT

5ft 5" 165cm

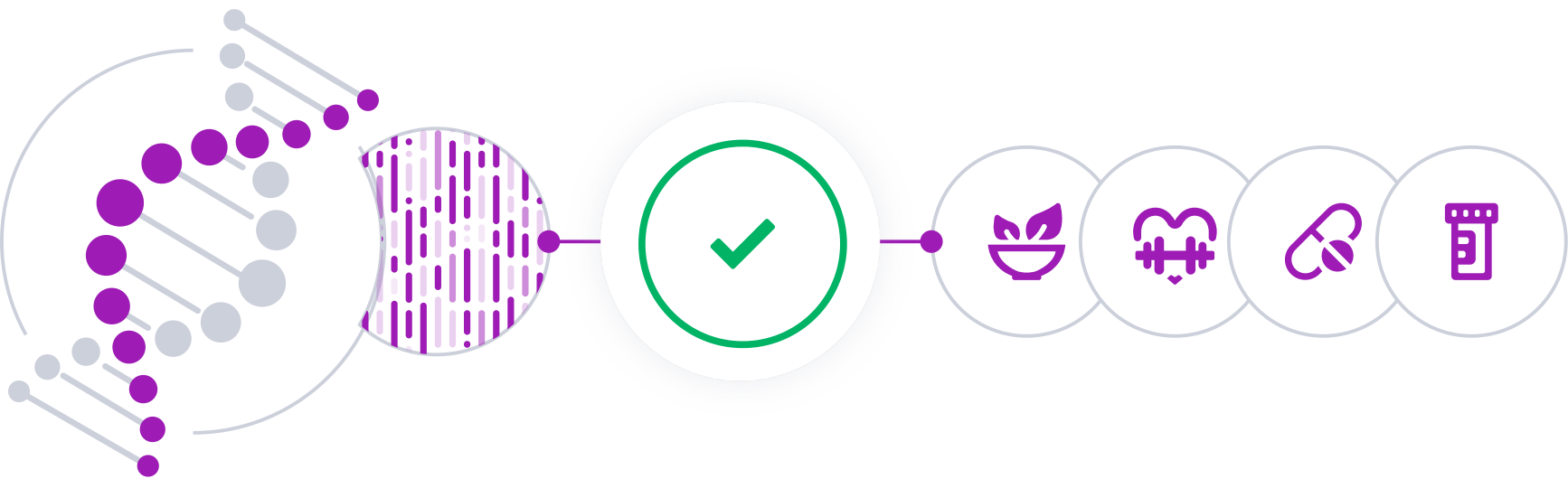
WEIGHT

137lb 62kg



How this works

Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.

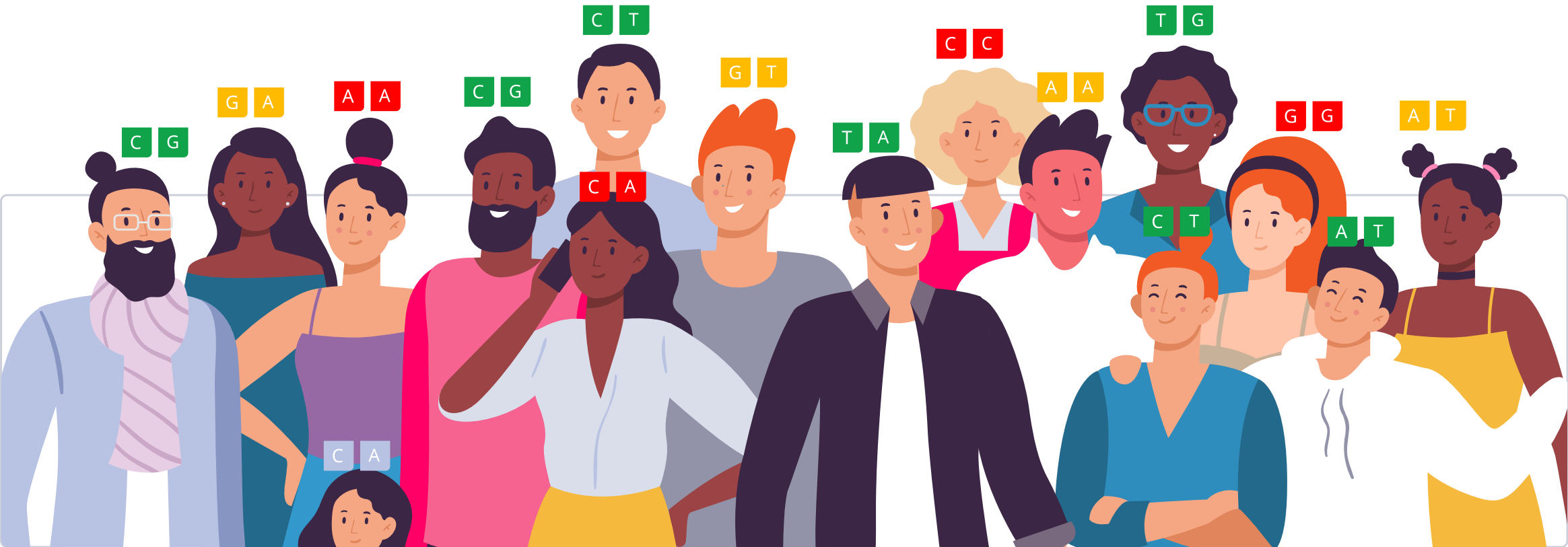


Similarly, our Trait Reports look at how your DNA influences your traits.



Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.

Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information.
We then summarize your results as a risk score or display it on a gauge.

In total, we analyze up to 83 million genetic variants.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

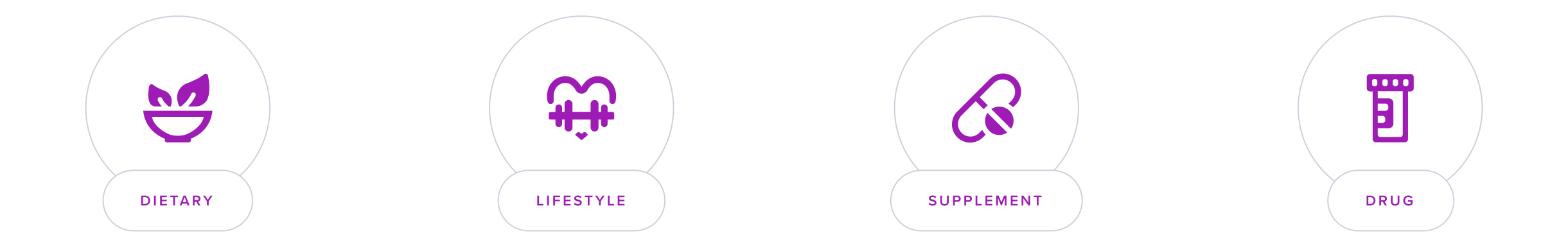
You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs. The following icons tell you which category a recommendation falls into:



Our team of scientists also ranks each recommendation.
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):



Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

Recommendation Evidence

- 5 / 5
- Recommendations that are considered effective and generally recommended by experts and medical bodies.
-
- 4 / 5
- Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.
-
- 3 / 5
- Recommendations that are considered possibly effective and have many studies supporting them
-
- 2 / 5
- Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.
-
- 1 / 5
- Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.
-
- 0 / 5
- No evidence in humans.

Genotype-specific Evidence

- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).
-
- Medium-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).
-
- Low-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).
-
- Indirect
- A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).
-
- In theory
- A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

Introduction

Adipogenesis refers to the formation, storage, and release of fat cells, a process that is significantly influenced by genetic variability.

These genetic differences help explain why some individuals find it easier to gain or lose weight, even when following similar diets and lifestyles. **Genes control not only how fat cells store energy but also how efficiently they release it for use.**

Understanding one's genetic predisposition for fat storage and release can be empowering, as it allows for more personalized diet and lifestyle choices aimed at optimizing energy balance and metabolic health. With the right insights into these genetic factors, individuals can make informed decisions to better support their unique genotype.

Genetics of Adipogenesis

Several genes influence adipogenesis, each playing a role in the differentiation of fat cells and the regulation of fat storage. These genetic variants impact how efficiently fat cells form and store energy, influencing overall body fat composition and metabolic health.

PPARGC1A (rs8192678, Gly482Ser G>A):

The *PPARGC1A* gene, also known as PGC-1α, is involved in the regulation of energy metabolism. The rs8192678 variant (Gly482Ser G>A) can impact mitochondrial function and fat cell differentiation, potentially influencing the body’s capacity for adipogenesis and energy storage.

MMP2 (rs1132896, Gly226Gly G>C): *MMP2* encodes a matrix metalloproteinase involved in tissue remodeling, which is crucial for fat tissue expansion. The rs1132896 variant (Gly226Gly G>C) may affect the ability of fat tissue to expand, impacting the formation of new adipocytes and the body’s capacity to store fat.

ADRB2 (rs1042713, Arg16Gly A>G): This variant in the *ADRB2* gene, rs1042713 (Arg16Gly A>G), influences the breakdown of fat within adipocytes. Changes in fat metabolism due to this variant can affect the balance between fat storage and fat utilization, influencing the rate of adipogenesis.

ADRB2 (rs1042714, Gln27Glu C>G): Another variant in the *ADRB2* gene, rs1042714 (Gln27Glu C>G), also plays a role in fat cell function and fat metabolism. This variant can impact how efficiently fat is stored versus mobilized, affecting adipogenesis and overall fat distribution.

PLIN (rs894160, 11482 G>A): The *PLIN* gene encodes perilipin, a protein that coats lipid droplets within fat cells, regulating lipid storage and release. The rs894160 variant (11482 G>A) can influence fat storage capacity within adipocytes, affecting overall body fat and susceptibility to obesity.

ADRB3 (rs4994, Trp64Arg T>C): The *ADRB3* gene is associated with fat metabolism, particularly in brown fat tissue. The rs4994 variant (Trp64Arg T>C) may reduce the



TYPICAL

Likely typical adipogenesis based on 8 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PPARG	rs1801282	CC
ADRB3	rs4994	AA
LPCAT2	rs1132896	GG
FABP2	rs1799883	CC
PEX11A	rs894160	CT
ADRB2	rs1042713	GA
PPARGC1A	rs8192678	TC
ADRB2	rs1042714	GC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

ability to burn fat, potentially leading to an increased number of fat cells and higher fat storage in response to excess energy intake.

FABP2 (rs1799883, Ala54Thr G>A): The *FABP2* gene encodes a fatty acid-binding protein involved in fat absorption and transport. The rs1799883 variant (Ala54Thr G>A) affects how fatty acids are handled within cells, potentially influencing adipogenesis and fat accumulation.

PPARG (rs1801282, Pro12Ala C>G): The *PPARG* gene is a central regulator of adipocyte differentiation and function. The rs1801282 variant (Pro12Ala C>G) can alter the gene’s activity, affecting adipogenesis and the body’s capacity to store fat. Individuals with this variant may experience differences in fat distribution and metabolic risk.

Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You'll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

- 1

Avoid BPA (Bisphenol A) Exposure
- 2

Good Eating Habits
- 3

Limit Trans Fats
- 4

Avoid Endocrine Disruptors
- 5

Avoid Rapid Weight Changes

1



Avoid BPA (Bisphenol A) Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

To avoid BPA exposure, choose BPA-free products, particularly when selecting food containers, water bottles, and baby bottles. Prefer glass, porcelain, or stainless steel containers, especially for hot food or liquids. Reduce use of canned foods as they may be lined with BPA and avoid handling thermal paper receipts, as they can contain BPA. When possible, select fresh or frozen foods over canned goods.

Description

Avoiding BPA (Bisphenol A) exposure involves minimizing contact with products or containers containing this chemical, which is commonly found in plastics and can potentially disrupt hormone regulation.

BPA (bisphenol A) is a chemical used to make certain plastics and resins. BPA-containing plastics are often used in containers that store food and beverages. Plastics marked with **recycling code 3 or 7** may contain BPA [\[R\]](#).

BPA is a well-known hormone disruptor. Research has linked BPA exposure to diabetes, heart disease, altered behavior, and more [\[R\]](#).

How it helps

Avoiding BPA exposure helps to minimize endocrine disruption, which can promote a more favorable hormonal environment for adipogenesis. This improved hormonal balance may assist in regulating fat storage and metabolism, contributing to healthier adipose tissue function.

2



Good Eating Habits

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Incorporate a variety of fruits, vegetables, whole grains, lean proteins, and healthy fats into your meals daily. Aim to eat at regular intervals, ideally three meals and one to two healthy snacks per day, to maintain energy levels and avoid overeating. Reduce consumption of processed foods, sugary snacks, and beverages.

Description

Practicing good eating habits, such as balanced and portion-controlled meals, can help maintain a healthy weight, support proper nutrition, and reduce the risk of chronic diseases.

Eating habits involve the how, what, when, and where of your diet. Some eating habits can be good for your health, but others... not so much.

Good eating habits include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Planning and preparing most of your meals
- Eating mindfully and slowly
- Only eating when hungry
- Not skipping meals

Developing good eating habits takes attention, practice, and effort [\[R\]](#).

How it helps

Good eating habits promote a balanced intake of nutrients, which is crucial for effective adipogenesis by fostering healthy fat storage and enhancing metabolic efficiency. This approach minimizes the risk of excess fat accumulation and metabolic disorders.

3



Limit Trans Fats

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

To limit trans fats, read food labels and choose products with 0 grams of trans fat. Avoid fried foods, packaged snacks, baked goods, and fast foods, which are common sources of trans fats. Aim to eliminate trans fats from your diet completely.

Description

Limiting trans fat intake is vital for heart health and reducing the risk of cardiovascular diseases. Avoiding foods high in trans fats and opting for healthier alternatives promotes better cardiovascular well-being.

Based on their structure, the fats in our diet can be broadly divided into *saturated* and *unsaturated* fat. Trans fat is a type of unsaturated fat [\[R, R, R\]](#).

In large amounts, trans fat and saturated fat may have a negative impact on your heart. Processed foods and animal products like red meat and dairy are rich in these fats [\[R, R, R\]](#).

How it helps

Limiting trans fats enhances lipid profiles and reduces inflammation, which can improve insulin sensitivity and promote healthier adipose tissue formation. This ultimately supports balanced adipogenesis and metabolic health.

4



Avoid Endocrine Disruptors

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Minimize exposure to endocrine disruptors by opting for organic foods to reduce pesticide intake, using glass or stainless steel instead of plastic containers for food and beverages, avoiding cosmetics and personal care products with parabens or phthalates, and regularly vacuuming and dusting your home to reduce contact with flame retardants found in household dust.

Description

Avoiding exposure to endocrine disruptors, such as certain chemicals found in plastics and pesticides, is crucial for maintaining hormonal balance and reducing the risk of hormone-related health problems.

Endocrine disruptors are chemicals that interfere with the body’s hormone (endocrine) system by [\[R\]](#), [\[R\]](#):

- Blocking the function or activity of hormones
- Mimicking the function of hormones

Based on limited studies, long-term exposure to these chemicals can have negative effects on health [\[R\]](#), [\[R\]](#).

Endocrine disruptors can be found in cosmetics, food products, pesticides, and other common household items [\[R\]](#).

How it helps

Avoiding endocrine disruptors assists in maintaining hormonal equilibrium, which is essential for regulating adipogenesis. By minimizing exposure to these chemicals, individuals can support healthier fat storage processes and reduce the risk of obesity-related complications.

5



Avoid Rapid Weight Changes

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Maintain a consistent, healthy weight by avoiding extreme dieting or sudden increases in food intake. Aim for gradual weight changes, not exceeding 1-2 pounds per week, by adjusting your diet and physical activity levels accordingly. This approach should be sustained over a long-term period to ensure health and prevent potential adverse effects on the body.

Description

Avoiding extreme and rapid weight changes, whether through crash diets or excessive calorie restriction, is essential for preventing negative health consequences such as nutritional deficiencies and metabolic disruptions.

Your weight is determined by the number of calories you consume compared to those you burn. Changes in exercise frequency, amount and type of food consumed, and alcohol intake may alter your energy expenditure. This may cause small weight fluctuations [\[R\]](#).

Some people may gain or lose weight at a faster rate. Rapid weight fluctuations may be due to [\[R\]](#), [\[R\]](#):

- Very drastic diets
- Water retention or dehydration
- Hormonal changes
- Pregnancy
- Taking certain medications
- Certain health conditions

How it helps

Avoiding rapid weight changes promotes metabolic stability, reducing the risk of nutritional deficiencies and allowing for healthier adipogenesis by facilitating a balanced energy homeostasis.