23andMe

Jamie King
Genetic Weight

Genetic Weight

Your genes influence not just your weight, but also the impact of different healthy habits.

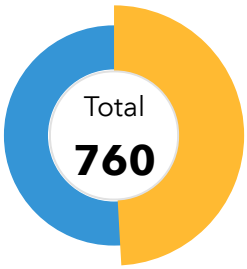
Your Wellness Result

Jamie, your genes predispose you to weigh about 3% more than average.

This predisposition doesn't mean you will definitely weigh more than average. Keep in mind that your lifestyle and environment have a big impact on your weight.

How did we calculate your result?

We determined your result by looking at DNA variants associated with weight based on our research. Some variants have a stronger effect on weight than others, which our analysis took into account. Because of this, your proportion of higher to lower weight variants may not exactly align with your overall predisposition. Keep in mind that other variants may also affect your weight. Learn more about how we calculated your result.



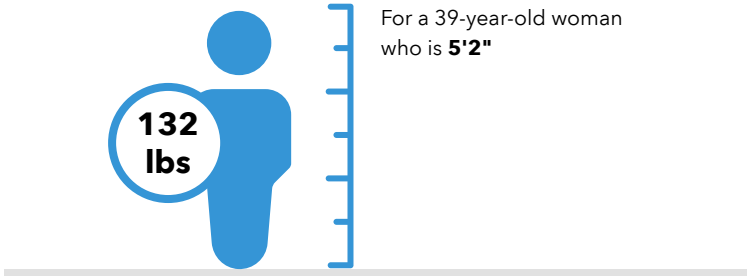
You have:

Variants associated with **lower weight**: 389

Variants associated with **higher weight**: 371

What is average?

The average weight for a woman your age who is 5'2" tall is 132 pounds, based on 23andMe participants of South Asian descent. The ancestry we used for your result is based on the information you provided in your settings. European is used as the default for people of mixed ancestry and for those of ancestries for which we do not yet have enough research participants.



For a 39-year-old woman
who is **5'2"**

Your reported weight is lower than your genetic result would predict.

In your health profile you told us you weigh 130 pounds. Your lifestyle and environment may be working to offset a tendency to weigh slightly more than you do. For reference, a recommended healthy weight range for someone your height is 101-136 pounds, based on CDC guidelines.

Healthy Habits for Your Genetics

We looked at 23andMe research participants with a genetic weight predisposition like yours and found certain lifestyle factors that were associated with the biggest weight differences.

1 Avoiding fast food

Associated with weighing up to **16.2% less**

People at a healthy weight ate fast food less than once per week, on average.

People who never ate fast food weighed up to 16.2% less than those who ate fast food almost every day or more.

2 Limiting red meat

Associated with weighing up to **14.7% less**

People at a healthy weight ate red meat less than 2 times per week, on average.

People who never ate red meat weighed up to 14.7% less than those who ate red meat every day.

3 Exercising

Associated with weighing up to **14.7% less**

People at a healthy weight exercised 2-3 times per week, on average.

People who exercised daily weighed up to 14.7% less than those who exercised less than once a week.

4 Eating vegetables

Associated with weighing up to **11.5% less**

People at a healthy weight ate 2-4 servings of vegetables per day, on average.

People who ate more than 7 servings of vegetables per day weighed up to 11.5% less than those who never ate vegetables.

5 Sleeping a healthy amount

Associated with weighing up to **11.4% less**

People at a healthy weight slept 7-8 hours per night, on average.

People who slept 8-9 hours per night weighed up to 11.4% less than those who slept less than 5 hours or more than 11 hours per night.

Important things to keep in mind

These associations were observed in 23andMe research participants of European descent, whose demographics and lifestyles may not be representative of the general population. Our analysis accounted for the effects of age and sex, but other genetic and non-genetic factors may also influence how these habits affect your weight and health.

Our analysis did not include all possible lifestyle factors, and those that were included may not be independent of one another. For example, people who exercise frequently might also tend to have healthy diets. This means that the effect of one habit on your weight may depend in part on your other habits. And don't forget that a healthy lifestyle is important for your overall health, regardless of your weight.

Always consult with a healthcare professional before making any major lifestyle changes. This test does not diagnose any health conditions or provide medical advice.

Healthy Habits for Your Genetics

We looked at 23andMe research participants with a genetic weight predisposition like yours and found the habits that were associated with the biggest weight differences. In general, we saw the biggest weight differences between people who practiced these habits most often compared to those who rarely or never did. This list is ranked from biggest to smallest effect based on your genetics.

People at a healthy weight...	We saw weight differences up to...
1. Avoided fast food *Ate less than once per week*	16.2%
2. Limited red meat *Ate less than 2 times per week*	14.7%
3. Exercised *2-3 times per week*	14.7%
4. Ate vegetables *2-4 times per day*	11.5%
5. Slept a healthy amount *7-8 hours per night*	11.4%
6. Ate leafy greens *4-5 times per week*	10.7%
7. Ate fish *1-2 times per week*	10.0%
8. Ate fruit *1-3 times per day*	8.1%
9. Ate yogurt *2-3 times per week*	5.3%
10. Managed stress *Had low levels on average*	4.1%

These findings are based on self-reported height, weight, and lifestyle data from over 45,000 23andMe research participants of European descent. Our analysis used body mass index (BMI), which provides a standardized metric for comparing weights across people of different heights. Differences in reported weight may be influenced by other lifestyle, demographic, and genetic factors not included in our analysis. See Scientific Details.

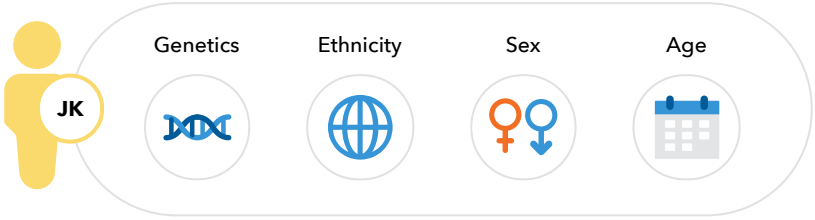
Keep exploring your Wellness results.

- Join the research effort and contribute to new discoveries.
- Compare your results to your family and friends.
- Join the discussion with other customers interested in Wellness.

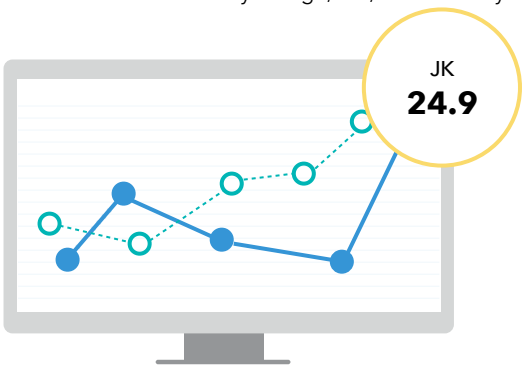
Scientific Details

How we determine your result

1. Collect some details from you. You tell us your age, sex, height, weight, and ethnicity, so we can customize your result.



2. Calculate your score. We use data from 23andMe research participants to create a genetic weight score based on your genotype at over 300 different genetic markers associated with weight. Based on your score, we then make a prediction about your BMI that also factors in your age, sex, and ethnicity.



About the Genetic Weight model

The markers used in the Genetic Weight model were determined from a genome-wide association study (GWAS) conducted in over 400,000 23andMe research participants of European descent.

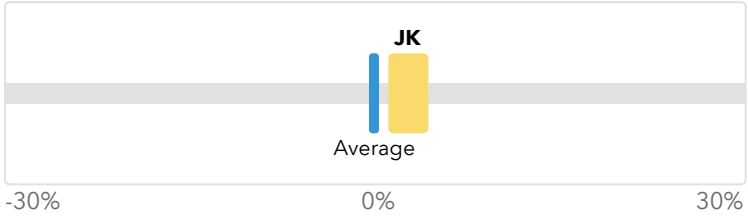
The model was created using people of European descent and was trained and validated in ancestry-specific populations. People of mixed ancestry or of an ancestry for which we do not yet have enough research participants receive the European trained model as a default.

The model used to determine your result was trained and validated in customers of South Asian descent.

Number of female customers used to train: **1,334**
Number of genetic markers: **381**
R^2 of predicted BMI vs. self-reported BMI in an independent sample: **0.06**
Significance (p-value): **<0.001**

3. Summarize your weight predisposition. To determine whether you have a genetic tendency to weigh more or less than average, we compare your BMI prediction to other 23andMe participants of your age, sex, and ethnicity. Because average weights change with age, how your predisposition compares to average may also change slightly over time. See our white paper about the science behind this report.

Predisposed to weigh **3%** more than average

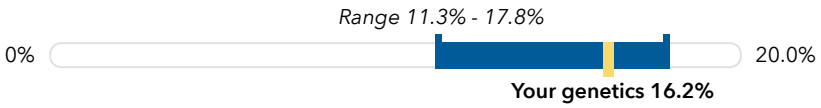
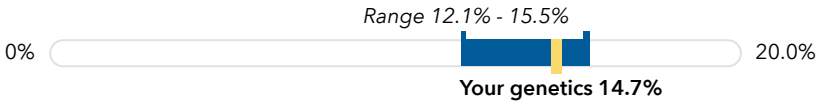
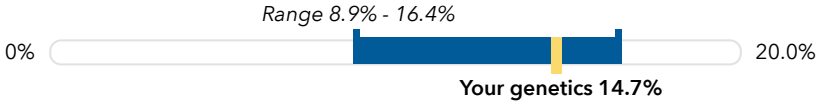
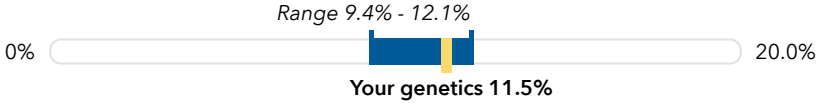
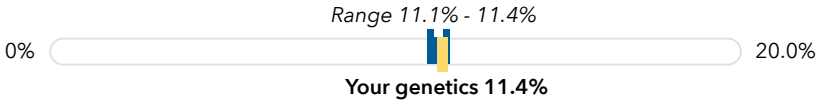
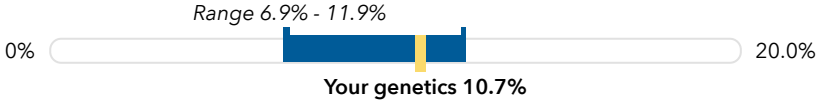
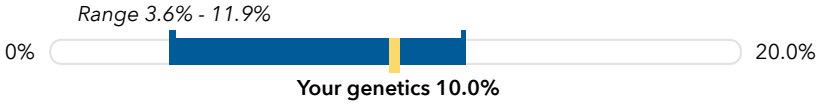
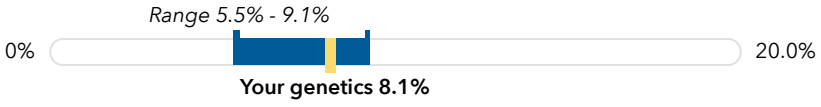
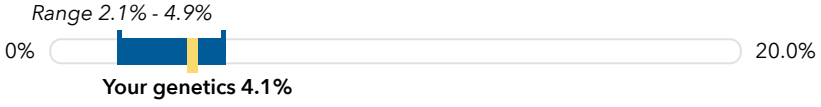


Genetics and Lifestyle Associations at 23andMe

Your genetics can actually influence how much lifestyle impacts your weight, which is called "gene-environment interaction."

We looked for these kinds of interactions by comparing the BMIs of 23andMe research participants with different genetics and different daily habits. In general, we saw the biggest weight differences between people who practiced these habits most often compared to those who rarely or never did. Each lifestyle choice seemed to have a slightly different effect on weight, depending on genetics. This table shows the average effect associated with your genetic weight predisposition as well as the range of effect seen in people with other predispositions.

Uncovering the connections between genetics, lifestyle, and weight is an active area of science, and our research efforts are ongoing.

Lifestyle factor	Range of observed results (% weight difference), from lowest to highest genetic weight predisposition
Avoiding fast food	
Limiting red meat	
Exercising	
Eating vegetables	
Sleeping a healthy amount	
Eating leafy greens	
Eating fish	
Eating fruit	
Eating yogurt	
Managing stress	

These findings are based on self-reported height, weight, and lifestyle data from over 45,000 23andMe research participants of European descent. All lifestyle factors included in the analysis were significantly correlated with BMI (correlation coefficients ranged from 0.2-0.3; all p-values < 0.0001).

Our analysis accounted for the effects of sex and age, but differences in reported weight may also be influenced by other lifestyle, demographic, and genetic factors not included.

See our white paper for details about the science behind this report. [https://permalinks.23andme.com/pdf/23_17-GeneticWeight_Feb2017.pdf]

References

1. Multhaup M et al. (2017). "23andMe White Paper 23-17: Estimating BMI and associated phenotypes with polygenic risk models." 23andMe White Paper. [https://permalinks.23andme.com/pdf/23_17-GeneticWeight_Feb2017.pdf]
2. Nettleton J et al. (2015). "Gene × dietary pattern interactions in obesity: analysis of up to 68 317 adults of European ancestry." Hum Mol Genet. 24(16):4728-38. [https://www.ncbi.nlm.nih.gov/pubmed/25994509]
3. Reddon H et al. (2016). "Physical activity and genetic predisposition to obesity in a multiethnic longitudinal study." Sci Rep. Jan 4;6:18672. [https://www.ncbi.nlm.nih.gov/pubmed/26727462]
4. U.S. Department of Health and Human Services and U.S. Department of Agriculture. "2015-2020 Dietary Guidelines for Americans." 8th Edition. December 2015. [http://health.gov/dietaryguidelines/2015/guidelines/]
5. U.S. Department of Health and Human Services. "2008 Physical Activity Guidelines for Americans." 2008. [http://health.gov/paguidelines/]

Change Log

Your report may occasionally be updated based on new information. This Change Log describes updates and revisions to this report.

Date	Change
March 3, 2017	Genetic Weight Report created

Jamie King's Report, printed on 2017-03-06 UTC