

SH2B1 GENE VARIANT



SH2B1, also known as **SH2B adapter protein 1**, refers to a gene found on chromosome 5 and the protein that the gene creates. The function of the SH2B1 protein is to improve the balance of the hormones insulin and leptin in the body. Insulin is made in the pancreas and helps to control blood sugar (glucose) levels by signaling the liver, muscles and fat cells to take in glucose from the blood. Circulating levels of insulin are strongly influenced by the amount and type of fat and carbohydrates consumed. Sometimes the body can stop responding to insulin, a state known as insulin resistance. This results in high blood sugar levels and signals the early stages of diabetes. Leptin is involved in controlling hunger levels and, like insulin, the body can stop responding to it appropriately. Individuals with the variant in the SH2B1 gene are at increased risk for reduced response to both insulin and leptin. This variation increases the likelihood of weight gain as a result of loss of the body's natural response to insulin and leptin. The key to successful weight loss and health management in SH2B1 carriers is to control the amount of fat and carbohydrates consumed, to eat smaller meals more frequently to reduce the demand for insulin, and to exercise frequently to improve leptin signaling.

DETAILED DIETARY RECOMMENDATIONS

1. **Eat five small meals a day.** Eating smaller, more frequent meals helps to control hunger and to improve how much insulin is released to help digest each meal.
2. **Eat a low fat diet** to maintain appropriate insulin levels. Choose monounsaturated fats over saturated fats or polyunsaturated fats to reduce the burden on the liver which can further reduce insulin function. Examples: olive oil, almonds, cashews, and avocados.

Top Tips:

Living With The SH2B1 Gene Variant

- *SH2B1 is involved with regulation of the hormones leptin and insulin. Insulin controls blood sugar, and leptin signals hunger. If leptin levels are high, hunger feels more intense.*
- *A high fat diet is associated with reduced insulin function in SH2B1 carriers.*
- *Eat a low glycemic diet to improve insulin levels.*
- *Eat five small meals each day to prevent over eating from hunger and to reduce the large insulin response needed to digest a large meal.*
- *Eat a high fiber diet to support fullness and lower insulin levels.*
- *Eat protein and fiber with each meal to improve insulin levels.*
- *Exercise 30-60 minutes at a moderate intensity each day to improve leptin levels.*



Delivering More Than A Test Result

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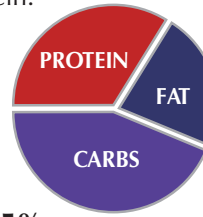
3. **Eat a higher amount of calories from protein.** Higher levels of protein have been shown to improve weight loss success and leptin sensitivity in obese individuals. Choose lean proteins like poultry and fish to reduce saturated and polyunsaturated fat intake.

4. **Eat low glycemic carbohydrates.**

The Glycemic Index is a relative ranking of carbohydrate in foods according to how they affect blood glucose levels. Insulin is produced in the pancreas to handle blood glucose. A meal high in carbohydrates that will be broken down quickly into glucose will result in a swift rise in insulin to manage that blood glucose. The goal is to keep the insulin response low, particularly in SH2B1 variant carriers because there is already an inappropriate response to existing insulin levels with this variant. Ideal: carbohydrates with a glycemic index < 55. Acceptable in moderation: carbohydrates with a glycemic index 55 – 70. Avoid as much as possible: Carbohydrates with a glycemic index greater than 70.

5. **Eat a high fiber diet.** A high fiber diet helps with feeling full, and in controlling glucose levels and therefore insulin levels in the blood. Aim for 25 - 30 grams of fiber each day. Eat fiber and protein at each meal.

Protein 35%
1200 calorie per day diet:
105 grams of protein.



Fat 20%
1200 calorie per day diet:
26 grams of fat.

Carbohydrates 45%
1200 calorie per day diet: 135 grams of carbohydrates.
In five small meals each day at a 1200 calorie per day diet, this should include 5-6 grams of fiber and 21 grams of protein at each meal.

PHYSICAL ACTIVITY RECOMMENDATIONS

Exercise 30 – 60 minutes at a moderate intensity each day. Frequent, moderate intensity exercise helps to keep insulin and leptin levels balanced to reduce weight gain and to control hunger.

Perceived Level of Exertion: “Feels like” moderate effort

Maximum Heart Rate (MHR): Exercise at a moderate intensity (70 - 80% of MHR) for the majority of the workout.
