GLYCEMIC INDEX DEFINED

All foods, drinks, snacks, nutrients, supplements, and anything else orally consumed by humans elicits a metabolic response. As food goes into the mouth and gets processed, the body has to decide what to do with the ingested item. There are two main pathways taken:

Pathway Number 1: **Store the item in adipose tissue fat cells**
Pathway Number 2: **Utilize (burn) the item as energy**

Humans are genetically *hard wired* to shunt foods into fat cells whenever possible, as that ensures survival. The mechanism by which the two main pathways are accessed depends on the G*lycemic Index* (GI) and Glycemic Load (GL) of the edible item.

If the consumed item has a *High GI and GL,* it will primarily take Pathway number one (1). If the food has a *Low GI and GL,* it will primarily take Pathway number two (2).

Quickly digested and metabolized foods possess the highest glycemic indices. Slowly digested foods release glucose gradually into the bloodstream, and are therefore, typically low glycemic.

All foods, drinks, and Nutraceuticals can be categorized as either high or low glycemic:

- High glycemic foods elevate blood glucose and insulin levels, and stimulate fat-storage.
- Low glycemic foods do not overly elevate blood glucose and insulin, and do not stimulate Lipoprotein Lipase (LPL) fat-storing mechanisms.

GLYCEMIC INDEX DEFINED

The Glycemic Index (GI) reflects the type and/or quality of carbohydrates in a particular food or edible agent, and how a specific portion of this food reacts metabolically as it is digested in the human digestive tract.

The four major areas that are tracked during glycemic clinical studies include how the ingested food:

1) Raises blood glucose levels
2) Affects insulin secretion
3) Stimulates Lipoprotein Lipase (LPL) and Fat-Storage Mechanisms
4) Affects the pancreas

The glycemic index is technically defined as the *"Incremental area under the blood glucose response curve of a specific portion of a test food expressed as a percent of the response to the same amount of carbohydrate from a standard food taken by the same subject."*

In simple terms, foods can be assigned a glycemic index number based on the comparative increases in blood glucose (sugar) levels they produce when that food is consumed. A low glycemic food causes a slower and more gradual rise in blood sugar than a high glycemic food, and maintains increased energy levels for a longer duration.

A high glycemic food increases blood sugar concentrations quickly, thus providing energy to the body in a short period of time. However, insulin is released in response to this rise in blood sugar, which, in turn,

brings the blood sugar down rapidly. This rapid decrease reduces the energy supply and triggers mild-to-intense hunger.

The glycemic response of a food also reflects the metabolic response to various percentages of protein, fat, and carbohydrates present in the food, which alter its glycemic response. Contrary to popular opinion, pure protein, eaten without carbohydrates, does elicit an insulin response, particularly in diabetics.

For example, milk (and protein drinks containing milk or protein without any additional carbohydrates) is a particularly potent insulin secretagogue, as the observed insulin response in clinical studies is about 5-fold greater than would be anticipated from the glucose response. This explains why excess milk ingestion can cause rapid weight gain (as is the case with bottle-fed infants).

In adults, excess milk or protein ingestion combined with lack of exercise, and inadequate muscle mass, results in excess body fat. Ingesting more than 30 grams of protein at one time results in automatic shunting of calories into adipose tissue fat cells, thus increasing abdominal girth. This is true in normal sized persons or large sized persons, such as 250-pound body builders, because excess protein will always stimulate fat-storage, despite the size of the individual. Protein powders that deliver more than 30 grams of protein cause increases in fat cell size, even in elite athletes.

ADIPOSE TISSUE FAT STORAGE

In humans, clinical measurements can be taken that identify the fat-storing properties of a food, and its path of metabolism. All foods, drinks, and Nutraceutical products (such as Meal Replacement drinks) are either burned as energy in the body or shunted into adipose tissue fat cells. Clinical studies can track the metabolic pathway of the food ingested, to discover if it is burned or stored.

Adipose Tissue Fat Studies focus on identification of the proclivity and ability of a "Test Food" to stimulate fat-storage in fat cells via stimulation of human fat-storing enzymes and mechanisms. During glycemic clinical studies, Test Foods can be clinically analyzed In Vivo to determine their metabolic fat-storing properties with optional specific focus on insulin-resistance disorders.

Understanding the fat-stimulating properties of foods allows for better control over food-driven fat-storage, obesity, insulin stimulation, reactive hypoglycemia, as well as exacerbation and development of Metabolic Syndrome, Insulin-Resistance, and type 2 diabetes.