



OPTIONS CENTER NUTRITION TOPIC



DIETARY HORMONES: INSULIN, GLUCAGON AND THE EICOSANOIDS By Ann Louise Gittleman

Eating food evokes a hormonal response. Carbohydrates stimulate secretion of the hormone insulin. For simplicity's sake, it is important to remember that protein produces the hormone glucagon, and certain fats provide the building blocks of the tissue like hormones known as eicosanoids.

A more comprehensive, biochemical approach would say that a more important trigger for either insulin or glucagon is the level of blood sugar. Low blood sugar triggers the pancreas to secrete glucagon, which acts to release glycogen stores from the liver and fat energy from adipose tissue. It is the delicate balance of carbohydrate, protein and fat that determines the levels of these hormones in the body. Research has shown that 40% carbohydrate, 30% protein, 30% fat at each meal is the right eating equation to help most individuals stabilize blood sugar levels and lower "fat promoting" insulin. In this way, your body becomes a fat-burning machine without deprivation or hunger.

INSULIN

Insulin is the key hormone that controls your blood sugar level after you eat carbohydrates. It helps muscle tissue use blood sugar as fuel for energy, and it helps store excess blood sugar in two ways. First, insulin helps store blood sugar in the liver and tissues as glycogen (a sugar). But glycogen storage has a limited capacity. Any excess beyond that is converted to body fat, again with the assistance of insulin. To increase glucagon relative to insulin, and thus enable the body to better access body fat, you need a more balanced proportion of carbohydrate, protein and fat at each meal. Along with a more balanced diet, exercise also reduces insulin levels.

We need to keep in mind that all the carbohydrates that our bodies absorb from food are converted into blood sugar, even from the least sugary of foods. But carbohydrates from low-glycemic food sources are converted more *slowly* into blood sugar, thus avoiding a rush of blood sugar and an answering rush of insulin into the bloodstream. High-glycemic carbohydrates (rice cakes and whole—wheat bread, for example) as well as simple sugars and processed carbohydrates (like white rice and bagels) produce these blood sugar and insulin rushes, with consequent depletion of blood sugar, loss of energy and concentration, and renewal of food cravings.[For more information on the glycemic index go to [Carbohydrates and the Glycemic Index](#)]

GLUCAGON

The protein hormone glucagon works in opposition to insulin. What insulin puts away in storage, glucagon puts back in use. The two hormones do not conflict with one another in the bloodstream, because when the insulin level is high, the glucagon level is low, and vice versa. When glucagon is ascendant in your bloodstream, you are spending – not putting away. When you want to lose weight, this is the kind of spending you need to do.

When your blood sugar level drops, glucagon is secreted in the pancreas. It is believed that both protein-rich foods and exercise induce this process. Glucagon causes the stored sugar glycogen to be released back into the bloodstream to restore the blood sugar level. In addition to releasing glycogen, glucagon releases fat from adipose tissue. This fat is then burned as fuel, and is thus lost by you, hopefully forever!

The opposed roles of insulin and glucagon can be summarized as follows:

Insulin	Glucagon
Lowers blood sugar level	Raises blood sugar level
Stores fat	Mobilizes fat from storage
Triggered by carbohydrates	Triggered by proteins

EICOSANOIDS

We need fats in our diet to provide the essential fatty acids that become part of the eicosanoids. Eicosanoids are natural hormones; that is, they are substances secreted by the body that have control over bodily functions. They are unusual in that they have such short lifetimes, existing for less than a few seconds. This short span of existence has made their study difficult, and comparatively little is known about them. Prostaglandins are the only eicosanoids most people recognize as a familiar name, and that is due to their importance in the male sexual system. But eicosanoids have a much larger role to play in human biology than they are generally credited with. In fact, some authorities claim that they control just about all hormones and every bodily function. They are known to be affected by the nutrients we absorb from food.

Like the different kinds of cholesterol, eicosanoids can be divided into “good” and “bad” categories. These words are placed in quotes because neither category of eicosanoids is good or bad in itself. Our bodies need both categories to be healthy. The most important thing is that both categories should be in – you guessed it – a state of balance.

From a nutritional point of view, the bad eicosanoids are so called because they tend to increase on a high-carbohydrate diet, with undesirable results in our bodies. Some physical results of good and bad eicosanoids are contrasted in the following lists:

“Good” Eicosanoids	“Bad” Eicosanoids
Blood vessel dilating	Blood vessel constricting
Anti blood clotting	Pro blood clotting
Bronchiole dilating	Bronchiole constricting
Anti cell proliferation	Pro cell proliferation
Immunity strengthening	Immunity weakening
Anti inflaming	Pro inflaming
Cholesterol reducing	Cholesterol increasing
Pain decreasing	Pain increasing
Antidepressive	-----
Endocrine hormone stimulating	-----
-----	Triglycerides increasing

The insulin-glucagon balance in our bloodstream is also important, since too much insulin produces too many bad eicosanoids. Now, if this is beginning to sound too complicated, don't despair. All you really need to know is that when you eat a balanced diet, your body will be able to burn its own body fat for energy and in so doing, give you more long-term appetite satisfaction and endurance on fewer calories.

Source: *The 40-30-30 Phenomenon*

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