D-Ribose Does Not Add to the Glycemic Load

"If D-ribose is a sugar, why doesn't it raise blood sugar level?" This frequently asked question can be answered simply by replying, "Because it is a five-carbon sugar, not a six-carbon sugar." And the difference is striking!

D-Ribose is of vital importance to many activities of the cell. It provides the backbone of the most important molecules in the body, such as ATP, the "energy currency" all cells need to function normally. Through the eons of evolution, D-ribose has become the foundation for the molecules that produce and regulate cellular activity.

D-Ribose is a five-carbon sugar that is an essential component of a wide number of compounds that control virtually every function of the cell. Adenosine triphosphate, or ATP, is the molecule that carries and provides the energy cells need to perform all the complex reactions that keep them alive and vital. D-Ribose provides the structural backbone of ATP and is the starting point for ATP synthesis.

D-Ribose also forms the backbone of both DNA (genes) and RNA. The genetic code could not exist without D-ribose, and information for the synthesis of proteins and other cellular components is carried by these molecules. Growth and development is entirely controlled by these D-ribose-containing compounds. D-Ribose is even important in fine-tuning cellular function. Within the cell there are many circulating compounds that act as messengers to speed up or slow down cellular reactions. These messengers also typically include D-ribose in their structure.

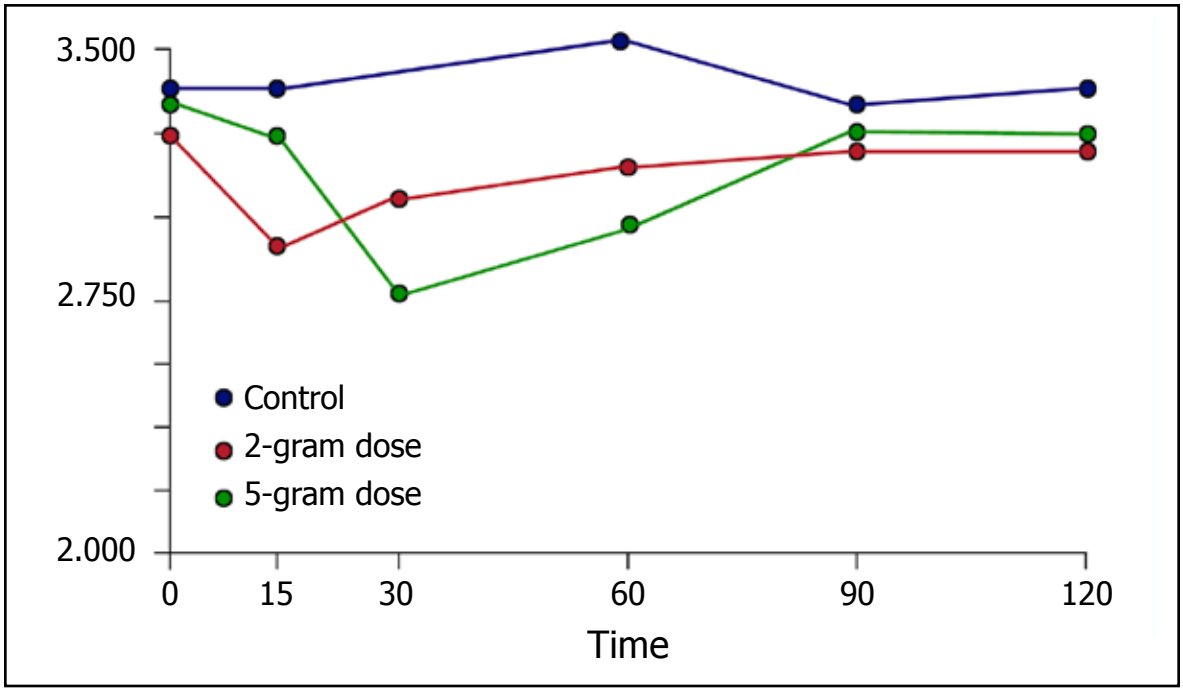
One of the obstacles to understanding the critical importance of D-ribose is the fact that it is a simple five-carbon sugar. The cell, however, understands how unique and important D-ribose is and treats it quite differently from other sugars. As everyone knows, simple sugars, or in their more complex chain form, carbohydrates, are one of three main sources of fuel for the cell. The others are fats and proteins. As fuels, the fate of all three is very similar. All are burned in respiration to give off energy, much like gasoline in a car. Carbohydrates, such as starch or glycogen, or simple sugars, such as glucose, are "burned" so that energy is given off.

The cell understands the tremendous difference between D-ribose and other simple sugars and has set up enzymatic pathways that keep D-ribose from being squandered as a fuel like glucose. As a result, D-ribose makes a very poor fuel. It is essential to *synthesizing* energy in the form of ATP, but is not a good fuel itself. The protective pathways set up by the cell protect it from being burned by mistake.

Because D-ribose is not burned as a fuel, the body does not recognize it as one. This keeps D-ribose from causing an insulin spike or elevating blood glucose levels when it is consumed. As seen in Figure 1, the real effect of D-ribose is to maintain blood glucose level, or to actually cause a slight decrease in blood sugar. This decrease is transient, dose dependant, and is not physiologically important. But this blood glucose modulating effect can be important when D-ribose is added to foods that do, by themselves, cause blood glucose levels to spike. The combined effect of D-ribose as the precursor for energy synthesis and its role in modulating blood sugar make it a very attractive nutrient for use in foods.

Figure 1

D-Ribose Modulates Blood Sugar Response



D-Ribose promotes a mild, transient, dose dependant decrease in blood sugar. Coupling this response with the proven energy synthesizing properties of D-ribose makes it an attractive nutritional ingredient.

D-Ribose: Ingredient Attributes

- Generally Recognized as Safe (GRAS)
- Low Taste Profile – 1/2 the sweetness of sucrose
- Dissolves Easily – in hot and cold solutions
- Reducing Sugar – must be careful when heated with certain amino acids
- Modulates Glycemic Index

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