

Role of Sugars in Human Neutrophilic Phagocytosis

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Notes: 100 g of sugar is about as much sugar in a can of soda.

Neutrophils are white blood cells and are the primary player of the initial innate immune response.

This study was designed to test:

- a) Whether carbohydrates other than glucose decreased the phagocytic capacity of neutrophils in normal human subjects**
- b) The duration of this effect**
- c) The effect of fasting on neutrophilic phagocytosis**

Venous blood was drawn from the arm after an overnight fast and at 0.5, 1, 2, 3, or 5 hours postprandial and this was incubated with a suspension of *Staphylococcus epidermidis*.

The phagocytic index (mean number of bacteria viewed within each neutrophil) was determined by microscopic examination.

Oral 100-g portions of carbohydrate from glucose, fructose, sucrose, honey, or orange juice all significantly decreased the capacity of neutrophils to engulf bacteria.

The decrease in phagocytic index was rapid following the ingestion of simple carbohydrates. The greatest effects occurred between 1 and 2 hours postprandial, but the values were still significantly below the fasting control values 5 hours after feeding.

The decreased phagocytic index was not significantly associated with the number of neutrophils. These data suggest that the function and not the number of phagocytes was altered by ingestion of sugars.

This implicates glucose and other simple carbohydrates in the control of phagocytosis and shows that the effects last for at least 5 hours. [40% less effective in killing pathogens].

On the other hand, a fast of 36 or 60 hours significantly increased the phagocytic index.