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### **Glucose and glutamine metabolism in the small intestine of septic rats.**

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#### **Abstract**

The intestinal metabolism of glucose and glutamine was studied in rats made septic by cecal ligation and puncture technique. Sepsis resulted in negative nitrogen balance and produced increases in the concentrations of blood pyruvate, lactate, alanine, and glutamine, and decreases in those of 3-hydroxybutyrate and acetoacetate. Both plasma insulin and glucagon concentrations were increased by 2.2- and 3.2-fold in septic rats, respectively. Portal-drained visceral blood flow increased in septic rats, and was accompanied by a decrease in the rates of utilization of glutamine and production of lactate, glutamate, and ammonia compared with those rates in sham-operated animals. Enterocytes isolated from septic rats showed decreased rates of glucose and glutamine utilization compared with cells isolated from corresponding controls. The maximal activities of hexokinase, 6-phosphofructokinase, pyruvate kinase, and glutaminase were decreased in intestinal mucosal scrapings of septic rats. It is concluded that a moderate form of sepsis decreases the rates of glucose and glutamine utilization (both in vivo and in vitro) by the epithelial cells of the small intestine. This may be caused by changes in the maximal activities of key enzymes in the pathways of glucose and glutamine metabolism in these cells as a metabolic adaptation to spare glucose and glutamine for use by other tissues.