

# ` Quick Review of Model System Research

**Effects of a Low-Carbohydrate, High-Protein Diet on Gut Microbiome Composition in Insulin Resistant Individuals with Chronic Spinal Cord Injury**

Quick Review of University of Alabama at Birmingham Spinal Cord Injury Model System (UAB-SCIMS) Research

### What is the study about?

This study looked at the effect of a low-carbohydrate, high-protein diet on the gut microbiome (the makeup of the bacteria that are in the digestive tract). The diet included lean meats, whole grains, fruits, and vegetables.

### What did the study find?

The study found that people with SCI who eat a healthy, low-carbohydrate, high-protein diet have improved gut microbiome.

### Who participated in the study?

Researchers at the UAB SCI Model System recruited 19 adults who were at least 3 years post-injury. They were between 18–65 years of age and with injury levels between C5-L2 and classified between A-D on the American Spinal Injury Association Impairment Scale.

### How was the study conducted?

The study divided participants at random into one of two groups. The study group had all of their weekly meals provided and delivered to their homes. A dietitian tailored the meals to each person’s taste preferences and made sure the meals met the healthy dietary guidelines of providing 40% energy from carbohydrates, 30% energy from protein, and 30% energy from fat. The control group continued their usual diet.

Stool samples were collected from both groups at the start of the study and at the end of the study 8 weeks later. The gut microbiome was measured from the stool samples.

### How can people use the results?

Past studies suggest that an imbalance of gut bacteria develops after SCI, which can lead to cardiometabolic diseases like obesity, diabetes, insulin resistance, and non-alcoholic fatty liver disease. Improving the imbalance of gut bacteria may help in preventing cardiometabolic disorders.

### Reference

Li J, Morrow C, McLain A, Womack ED, Yarar-Fisher C. Effects of a Low-Carbohydrate, High-Protein Diet on Gut Microbiome Composition in Insulin-Resistant Individuals With Chronic Spinal Cord Injury: Preliminary Results From a Randomized Controlled Trial. Arch Phys Med Rehabil. 2022 Jul;103(7):1269-1278. doi: 10.1016/j.apmr.2022.03.014. Epub 2022 Apr 10. PMID: 35417758.[add link to abstract]

### Disclaimer

The contents of this quick review were developed under grants from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant numbers 90SI5019 and 90DPKT0009). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this quick review do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.