



**SOUTH DAKOTA  
STATE UNIVERSITY**

Department of Animal Science

# Beef Day 2020

**Meats & Human Nutrition**

---

## **Daily beef consumption as a part of the DASH diet influences blood biomarkers of cardiometabolic and muscle health in older adults**

*M. Hossain and C. Perry*

### **Objective**

To determine the effect of the DASH diet containing beef on insulin sensitivity, cholesterol and muscle in adults 65 and older.

### **Study Description**

Twenty-eight males (n = 11) and females (n = 17) aged 71 years (range: 65-84y) were randomly assigned to consume either 3 oz. (n = 14) or 6 oz. (n = 14) of fresh, lean beef as a part of the DASH diet for 12-weeks. The seven-day cyclical menu consumed by all participants contained fresh lean beef as the primary protein source. Other red meats, poultry and seafood were not included. Breakfast, lunch and dinner was provided every day for 12-weeks and all food items were purchased, prepared and weighed to the nearest gram by the research staff. The portions of beef (3 or 6 oz) were evenly distributed throughout each of the three meals provided every day. Blood samples were collected at weeks 0, 3, 6, 9, and 12. Samples were used to measure glucose, insulin, total cholesterol, LDL, HDL, myostatin (inhibitor of muscle growth), and insulin-like growth factor 1(IGF-1; biomarker of muscle growth). Homeostatic model assessment of insulin resistance (HOMA-IR) was calculated.

### **Take home points**

Changes in all biomarkers were observed during the 12-week feeding study regardless of beef intake. Significant effects of the diet across time were detected for: glucose (P = 0.005); HOMA-IR (P < 0.05); total cholesterol (P = 0.001); LDL (P = 0.001); HDL (P = 0.001); and myostatin (P < 0.05) such that a decrease was observed over the 12-week intervention period. Time effects were also detected for IGF-1(P = 0.001) such that an increase was observed over the 12-week intervention period. Glucose levels decreased (P < 0.05) baseline (105mg/dL) to study-end (95.3mg/dL); HOMA-IR decreased (P < 0.05) from baseline (3.6) to study-end (2.6); total cholesterol decreased (P < 0.05) from baseline (181mg/dL) to study-end (171.4mg/dL); HDL decreased (P < 0.05) from baseline (54.1mg/dL) to study-end (49.6mg/dL); myostatin decreased (P < 0.05) from baseline (3.4ng/mL) to study-end (2.8ng/mL); IGF-1 increased (P < 0.05) from baseline (94.8ng/mL) to study-end (102.6ng/mL). Insulin was well-maintained (P > 0.05) throughout the study.

The results of this highly-controlled dietary intervention study indicate that high quality dietary patterns that contain daily intakes of high-quality protein positively influences biomarkers of

cardiometabolic and muscle health in older adults. These results also suggest that beef can be included in healthy dietary patterns.

**Acknowledgements**

South Dakota Beef Industry Council, Sanford Health – South Dakota State University Collaborative Research Seed Grant Program, and USDA-NIFA Hatch Program

**Keywords:** adults, beef consumption, DASH diet, health