

# Animal protein and the risk of kidney stones: a comparative metabolic study of animal protein sources.

## Author information

- 1 Department of Urology, University of Iowa, Iowa City, Iowa.
- 2 Department of Urology, University of Wisconsin-Madison, Madison, Wisconsin.
- 3 Department of Urology, University of Texas Southwestern Medical Center, Dallas, Texas.
- 4 Jane and Charles Pak Center for Mineral Metabolism and Clinical Research, University of Texas Southwestern Medical Center, Dallas, Texas.
- 5 Department of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, Texas.
- 6 Department of Urology, University of Texas Southwestern Medical Center, Dallas, Texas; Jane and Charles Pak Center for Mineral Metabolism and Clinical Research, University of Texas Southwestern Medical Center, Dallas, Texas. Electronic address: Margaret.pearle@utsouthwestern.edu.

## **Abstract**

### **PURPOSE:**

We compared the effect of 3 animal protein sources on urinary stone risk.

### **MATERIALS AND METHODS:**

A total of 15 healthy subjects completed a 3-phase randomized, crossover metabolic study. During each 1-week phase subjects consumed a standard metabolic diet containing beef, chicken or fish. Serum chemistry and 24-hour urine samples collected at the end of each phase were compared using mixed model repeated measures analysis.

### **RESULTS:**

Serum and urinary uric acid were increased for each phase. Beef was associated with lower serum uric acid than chicken or fish (6.5 vs 7.0 and 7.3 mg/dl, respectively, each  $p < 0.05$ ). Fish was associated with higher urinary uric acid than beef or chicken (741 vs 638 and 641 mg per day,  $p = 0.003$  and  $0.04$ , respectively). No significant difference among phases was noted in urinary pH, sulfate, calcium, citrate, oxalate or sodium. Mean saturation index for calcium oxalate was highest for beef (2.48), although the difference attained significance only compared to chicken (1.67,  $p = 0.02$ ) but not to fish (1.79,  $p = 0.08$ ).

### **CONCLUSIONS:**

Consuming animal protein is associated with increased serum and urine uric acid in healthy individuals. The higher purine content of fish compared to beef or chicken is reflected in higher 24-hour urinary uric acid. However, as reflected in the saturation index, the stone forming propensity is marginally higher for beef compared to fish or chicken. Stone formers should be advised to limit the intake of all animal proteins, including fish.

Copyright © 2014 American Urological Association Education and Research, Inc. Published by Elsevier Inc. All rights reserved.

**Source link:** <https://www.ncbi.nlm.nih.gov/pubmed/24518789>