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**Meta-analysis of the quantity of calcium excretion associated with the net acid excretion of the modern diet under the acid-ash diet hypothesis.**

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**BACKGROUND:**

The acid-ash diet hypothesis of osteoporosis suggests that acid from the modern diet causes a demineralization of the skeleton, and mobilized bone calcium is excreted. A systematic approach has not been used to summarize the findings of the numerous studies about the hypothesis.

**OBJECTIVES:**

The purpose of this meta-analysis was to estimate the quantity of net acid excretion and calciuria associated with the modern diet, to assess the association between acid excretion and calcium excretion, and to assess the influence of urine preservatives on calcium measurement.

**DESIGN:**

We systematically searched for trials of the acid-ash hypothesis and conducted a meta-analysis.

**RESULTS:**

Twenty-five of 105 studies met the inclusion criteria. The estimated quantity of net acid excretion from the weighted average of the control diets from 11 studies was 47 mEq/d. The increase in urinary calcium with a change in renal net acid excretion depended on whether the urine was acidic or alkaline ( $P < 0.001$ ). A significant linear relation was observed between net acid excretion and calcium excretion for both acidic and alkaline urine ( $P < 0.001$ ). The estimated change in urine calcium associated with a change of 47 mEq of net acid excretion in acidic urine was 1.6 mmol/d (66 mg/d) of calcium.

**CONCLUSION:**

Evidence suggests a linear association between changes in calcium excretion in response to experimental changes in net acid excretion. However, this finding is not evidence that the source of the excreted calcium is bone or that this calciuria contributes to the development of osteoporosis.