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### **Measurement of net acid excretion by use of paper strips.**

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#### **OBJECTIVE:**

Net endogenous acid production, reflected in the steady state as net acid excretion (NAE), is implicated in bone loss because it is positively associated with urinary calcium loss. Protein is one of the main sources of dietary acid load, whereas fruit and vegetables provide alkaline potassium salts that counteract the dietary acid load. This study investigated whether a pH paper strip measurement of overnight (i.e., first void) urine would reflect 24-h NAE, measured as excretion rates of titratable acid minus bicarbonate plus ammonium.

#### **METHODS:**

Twenty-three subjects collected 24-h urine in two parts: day (approximately 7 am to 11 pm) and overnight (approximately 11 pm to 7 am). At first void, subjects recorded pH using paper strips. Subjects recorded intake and 20 subjects provided fasting urine collected from 7 to 9 am.

#### **RESULTS:**

The pH paper strip measurements of first void urine was significantly correlated with 24-h titratable acid minus bicarbonate ( $r = -0.466$ ,  $P < 0.025$ ) but not with 24-h NAE. We examined the association of dietary protein, potassium, protein:potassium ratio, and sodium with NAE, with fasting morning urinary calcium excretion, an indirect measurement of bone loss, and with urinary cross-links, a direct measurement of bone resorption. Of these, only sodium intake (measured as 24-h urine excretion) and urine potassium:sodium ratio showed a significant relation (with fasting calcium excretion).

#### **CONCLUSIONS:**

We did not find that the first void urine pH by paper strip measurement provided an index of daily net endogenous acid production as reflected in 24-h NAE. In our sample of young adults, daily sodium intake positively correlated with bone resorption, as reflected in fasting urine calcium, whereas daily NAE did not.