|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Model 1 |  | Model 2 |  |
| (units) | n missing | Estimate (95% CI) | *P-value* | Estimate (95% CI) | *P-value* |
| pH | 18 | 0.006 (0.004, 0.008) | **<0.0001** | 0.005 (0.003, 0.007) | **<0.0001** |
| Normalized Calcium (mg/g) | 11 | 1.14 (0.90, 1.38) | **<0.0001** | 0.96 (0.71, 1.21) | **<0.0001** |
| Normalized Oxalate (mg/g) | 17 | 0.005 (-0.04, 0.05) | 0.8371 | 0.02 (-0.03, 0.07) | 0.4067 |
| Normalized Citrate (mg/g) | 17 | 3.23 (2.52, 3.95) | **<0.0001** | 2.80 (2.06, 3.54) | **<0.0001** |
| Normalized Uric Acid (g/g) | 10 | 1.42 (1.03, 1.81) | **<0.0001** | 1.30 (0.89, 1.71) | **<0.0001** |
| Normalized Sodium (mmol/g) | 17 | 0.06 (-0.07, 0.20) | 0.3371 | 0.07 (-0.07, 0.21) | 0.3328 |
| Normalized Potassium (mmol/g) | 21 | 0.11 (0.06, 0.16) | **<0.0001** | 0.11 (0.06, 0.16) | **<0.0001** |
| Normalized Magnesium (mmol/g) | 22 | 0.24 (0.14, 0.33) | **<0.0001** | 0.20 (0.11, 0.30) | **<0.0001** |
| Normalized Phosphorus (g/g) | 17 | 1.37 (0.82, 1.91) | **<0.0001** | 1.16 (0.59, 1.73) | **<0.0001** |
| Normalized Ammonium (mmol/g) | 21 | 0.08 (0.04, 0.11) | **<0.0001** | 0.06 (0.03, 0.10) | **0.0009** |
| Normalized Chloride (mmol/g) | 142 | 0.04 (-0.09, 0.19) | 0.5108 | 0.07 (-0.08, 0.22) | 0.3566 |
| Normalized Sulfur (mEq/g) | 23 | 0.02 (-0.01, 0.05) | 0.1534 | 0.02 (-0.01, 0.05) | 0.2641 |
| Normalized UUN (mg/g) | 138 | 0.01 (0.002, 0.02) | **0.0092** | 0.01 (0.002, 0.02) | **0.0128** |
| SS Calcium Oxalate | 142 | 0.03 (0.02, 0.04) | **<0.0001** | 0.02 (0.01, 0.03) | **0.0003** |
| SS Calcium Phosphate | 142 | 0.01 (0.01, 0.01) | **<0.0001** | 0.01 (0.005, 0.01) | **<0.0001** |
| SS Uric Acid | 142 | -0.004 (-0.01, -0.001) | **0.0080** | -0.004 (-0.008, -0.001) | **0.0212** |
| Protein Catabolic Rate (g/day) | 189 | 0.003 (-0.001, 0.002) | 0.5378 | 0.00 (-0.001, 0.001) | 0.6897 |
| Volume (L) | 1 | 0.00 (-0.002, 0.004) | 0.6906 | 0.001 (-0.002, 0.004) | 0.4242 |
| Creatinine (mg) | 0 | -2.68 (-4.23, -1.13) | **0.0007** | -1.96 (-3.55, -0.36) | **0.0162** |

**Table S1**: Normalized 24-Hour Urine Results from Models 1 and 2

SS: Supersaturation

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Univarible |  | Model 1 |  | Model 2 |  | Model 3 |  |
| (units) | n missing | Estimate (95% CI) | *P-value* | Estimate (95% CI) | *P-value* | Estimate (95% CI) | *P-value* | Estimate (95% CI) | *P-value* |
| Calcium (mg) | 11 | 1.45 (1.10, 1.80) | **<0.0001** | 1.27 (0.86, 1.68) | **<0.0001** | 1.07 (0.64, 1.50) | **<0.0001** | 0.96 (0.53, 1.39) | **<0.0001** |
| Oxalate (mg) | 17 | -0.07 (-0.12, -0.02) | **0.0066** | -0.05 (-0.11, 0.01) | 0.0857 | -0.02 (-0.08, 0.04) | 0.4415 | -0.03 (-0.09, 0.03) | 0.3623 |
| Citrate (mg) | 17 | 2.75 (1.81, 3.69) | **<0.0001** | 3.32 (2.20, 4.43) | **<0.0001** | 2.91 (1.75, 4.06) | **<0.0001** | 3.07 (1.91, 4.23) | **<0.0001** |
| Uric Acid (g) | 10 | 0.001 (0.001, 0.002) | **0.0007** | 0.001 (0.00, 0.001) | **0.0379** | 0.001 (0.00, 0.002) | **0.0439** | 0.001 (0.00, 0.001) | **0.0352** |
| Sodium (mmol) | 17 | -0.07 (-0.28, 0.15) | 0.5590 | -0.23 (-0.47, 0.01) | 0.0657 | -0.13 (-0.38, 0.12) | 0.3110 | -0.10 (-0.35, 0.16) | 0.4607 |
| Potassium (mmol) | 21 | -0.02 (-0.10, 0.05) | 0.5050 | 0.06 (-0.02, 0.14) | 0.1593 | 0.09 (0.003, 0.17) | **0.0434** | 0.10 (0.01, 0.18) | **0.0260** |
| Magnesium (mmol) | 22 | 0.15 (0.03, 0.28) | **0.0153** | 0.16 (0.02, 0.30) | **0.0265** | 0.14 (-0.005, 0.29) | 0.0577 | 0.14 (-0.01, 0.29) | 0.0719 |
| Phosphorus (g) | 17 | 0.001 (0.00, 0.002) | 0.1930 | 0.00 (-0.001, 0.001) | 0.6906 | 0.00 (-0.001, 0.002) | 0.6309 | 0.00 (-0.001, 0.002) | 0.4377 |
| Ammonium (mmol) | 21 | 0.10 (0.05, 0.16) | **0.0002** | 0.06 (-0.001, 0.12) | 0.0554 | 0.05 (-0.01, 0.11) | 0.1261 | 0.05 (-0.01, 0.12) | 0.1180 |
| Chloride (mmol) | 142 | -0.11 (-0.35, 0.13) | 0.3760 | -0.24 (-0.50, 0.03) | 0.0802 | -0.11 (-0.38, 0.16) | 0.4153 | -0.07 (-0.34, 0.20) | 0.6091 |
| Sulfur (mEq) | 23 | -0.01 (-0.07, 0.05) | 0.8230 | -0.03 (-0.10, 0.03) | 0.3453 | -0.02 (-0.09, 0.05) | 0.5898 | 0.002 (-0.07, 0.07) | 0.9602 |
| UUN (mg) | 138 | -0.01 (-0.02, 0.01) | 0.3350 | -0.01 (-0.02, 0.01) | 0.3934 | -0.003 (-0.02, 0.01) | 0.7480 | 0.002 (-0.01, 0.02) | 0.7931 |

**Table S2**: Absolute Urine Results From All Models

**Table S3**: Change in Serum Chemistries Across Quintile

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (units) | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | P-value |
| Sodium (mmol/L) | 139 (2.37)  n = 161 | 140 (2.88)  n = 161 | 139 (2.65)  n = 161 | 140 (2.79)  n = 161 | 139 (2.84)  n = 161 | 0.3430 |
| Potassium (mmol/L) | 4.09 (0.408)  n = 161 | 4.09 (0.424)  n = 162 | 4.18 (0.490)  n = 161 | 4.25 (0.427)  n = 161 | 4.35 (0.524)  n = 161 | **<0.0001** |
| Bicarbonate (mmol/L) | 23.9 (2.94)  n = 155 | 24.5 (3.41)  n = 158 | 24.6 (3.53)  n = 160 | 24.8 (2.90)  n = 160 | 23.5 (3.34)  n = 160 | **0.0052** |
| BUN (mg/dL) | 12.8 (4.13)  n = 161 | 14.7 (4.24)  n = 161 | 16.0 (7.54)  n = 162 | 17.5 (5.88)  n = 162 | 22.7 (10.8)  n = 162 | **<0.0001** |
| Calcium (mg/dL) | 9.19 (0.609)  n = 162 | 9.12 (0.582)  n = 161 | 9.30 (0.779)  n = 161 | 9.24 (0.611)  n = 161 | 9.22 (0.571)  n = 160 | 0.1250 |
| Magnesium (mg/dL) | 1.86 (0.216)  n = 77 | 1.88 (0.235)  n = 69 | 1.96 (0.460)  n = 67 | 1.87 (0.240)  n = 75 | 1.87 (0.290)  n = 84 | 0.3250 |
| Phosphorus (mg/dL) | 3.35 (0.795)  n = 66 | 3.11 (0.629)  n = 56 | 3.22 (0.876)  n = 58 | 3.17 (0.742)  n = 55 | 3.28 (0.981)  n = 69 | 0.5390 |
| Uric Acid (mg/dL) | 4.80 (1.71)  n = 94 | 4.55 (1.96)  n = 92 | 4.81 (2.05)  n = 105 | 5.46 (2.15)  n = 86 | 6.01 (2.22)  n = 108 | **<0.0001** |
| Parathyroid Hormone (pg/dL) | 44.0 (22.8)  n = 98 | 48.0 (23.8)  n = 94 | 48.8 (31.8)  n = 96 | 49.8 (30.7)  n = 82 | 63.8 (45.5)  n = 101 | **0.0003** |
| Hemoglobin A1c (%) | 6.72 (1.51)  n = 49 | 6.13 (0.965)  n = 61 | 5.97 (0.945)  n = 58 | 6.56 (1.46)  n = 58 | 7.52 (5.46)  n = 67 | **0.0209** |

Figure S1: Relationship Between Kidney Function and Normalized 24-Hour Urine Parameters Diagram, scatter chart

Description automatically generated

Figure S1: Relationship Between Kidney Function and Normalized 24-Hour Urine Parameters. eGFR and 24-hour urine analyte of interest were assessed by univariate linear regression. Points are colored based on a patient’s stone type. R-squared and p-values for each analyte of interest are reported.