The followings are some supplemental material of this article.

**Supplementary Table S1.** The variance apportionment of log-transformed Cr, Mn, Fe, Zn and Se concentrations in spot samples stratified by time of day of sample collection.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time of samples | Cr | Mn | Fe | Zn | Se |
| **Morning (n = 154)** | | | | | |
| ICC | 0.01 | 0.13 | 0.13 | 0.37 | 0.02 |
| Between-individual σ2 (%)\* | 0.004 (1%) | 0.041 (13%) | 0.032 (13%) | 0.046 (37%) | 0.001 (2%) |
| Within-individual, inter-day σ2 (%)† | 0.075 (19%) | 0.010 (3%) | 0.001 (1%) | 0.035 (28%) | 0.018 (44%) |
| Within-individual, intra-day σ2 (%)‡ | 0.309 (80%) | 0.265 (84%) | 0.203 (86%) | 0.043 (35%) | 0.022 (54 %) |
| **Afternoon (n = 185)** | | | | | |
| ICC | 0.01 | 0.01 | 0.01 | 0.55 | 0.11 |
| Between-individual σ2 (%)\* | 0.001 (1%) | 0.002 (1%) | 0.001 (1%) | 0.068 (55%) | 0.004 (11%) |
| Within-individual, inter-day σ2 (%)† | 0.042 (31%) | 0.078 (24%) | 0.029 (11%) | 0.018 (14%) | 0.018 (48%) |
| Within-individual, intra-day σ2 (%)‡ | 0.091 (68%") | 0.243 (75%) | 0.220 (88%) | 0.038 (31%) | 0.015 (41 %) |
| **Evening (n = 190)** | | | | | |
| ICC | 0.04 | 0.10 | 0.13 | 0.48 | 0.01 |
| Between-individual σ2 (%)\*2 | 0.007 (4%) | 0.026 (10%) | 0.034 (13%) | 0.053 (48%) | 0.001 (1%) |
| Within-individual, inter-day σ2 (%)† | 0.058 (33%) | 0.020 (7%) | 0.030 (12%) | 0.023 (21%) | 0.014 (54%) |
| Within-individual, intra-day σ2 (%)‡ | 0.113 (63%) | 0.227 (83%) | 0.188 (75%) | 0.034 (31%) | 0.012 (45%) |

Cr, chromium; Fe, iron; ICC, intraclass correlation coefficient; Mn, manganese; Se, selenium; Zn, zinc.

\* The proportion of between-individual variance to total variance.

† The proportion of within-individual inter-day variance to total variance.

‡ The proportion of within-individual intra-day variance to total variance.

**Supplementary Figure S1.** Creatinine-adjusted Cr, Mn, Fe, Zn and Se concentrations (µg/g creatinine) in spot samples collected on 8 days over a 3-month period from 11 men \*

E:\OneDrive - hust.edu.cn\男性健康队列\必需微量元素变异\必需微量元素变异_2018年11月26日\投稿_JN_20181231\Figure1.tif

Cr, chromium; Fe, iron; Mn, manganese; Se, selenium; Zn, zinc.

\* Each graph represents a participant (labeled as P1-P11). The dots in each graph represent the element concentrations in each spot sample (including first-morning voids).