**Supplementary Table 1: Stratified analyses of associations between dietary zinc intake and HCC risk.**

| **Characteristics** | **Cases/controls** | **OR (95% CI) \*** | ***P*trend value** | ***P*interaction value** |
| --- | --- | --- | --- | --- |
| **per-SD increase** |
| Sex |  |  |  | 0.041 |
| Women | 73/73 | 0.65 (0.16, 2.67) | 0.126 |  |
| Men | 361/361 | 0.54 (0.32, 0.92) | 0.038 |  |
| Age (years) |  |  |  | 0.526 |
| ≤60 | 227/222 | 0.68 (0.39, 1.20) | 0.310 |  |
| >60 | 207/212 | 0.01 (0.00, 2.76) | 0.074 |  |
| Smoking status |  |  |  | 0.433 |
| No | 169/327 | 0.94 (0.68, 1.30) | 0.062 |  |
| Yes | 265/107 | 0.61 (0.43, 0.87) | 0.685 |  |
| Alcohol drinking status |  |  |  | 0.347 |
| No | 253/367 | 0.71 (0.55, 0.92) | 0.427 |  |
| Yes | 181/67 | 1.14 (0.59, 2.18) | 0.036 |  |
| HBsAg (+) |  |  |  | 0.300 |
| No | 66/366 | 0.74 (0.52, 1.06) | 0.234 |  |
| Yes | 368/51 | 0.75 (0.53, 1.06) | 0.051 |  |
| History of fatty liver disease |  |  |  | 0.558 |
| No | 339/375 | 0.73 (0.55, 0.97) | 0.140 |  |
| Yes | 95/52 | 0.63 (0.35, 1.11) | 0.386 |  |
| History of diabetes |  |  |  | 0.236 |
| No | 378/390 | 0.82 (0.64, 1.04) | 0.025 |  |
| Yes | 56/44 | 0.15 (0.04, 0.62) | 0.073 |  |

BMI: Body mass index; CI: Confidence interval; HBsAg: Hepatitis B surface antigen; HCC: Hepatocellular carcinoma; HEI-2015: Healthy Eating Index 2015; OR: Odds ratio; SD: Standard deviation. \*Adjusted for sex, age, total energy intake, BMI, smoking status, alcohol drinking status, HEI-2015, HBsAg, history of fatty liver disease, and history of diabetes.

**Supplementary Table 2: Stratified analyses of associations between serum zinc levels and HCC risk.**

| **Characteristics** | **Cases/controls** | **OR (95% CI)\*** | ***P*trend**  **value** | ***P*interaction value** |
| --- | --- | --- | --- | --- |
| **per-SD increase** |
| Sex |  |  |  | 0.010 |
| Women | 73/73 | 0.30 (0.03, 3.20) | 0.652 |  |
| Men | 361/361 | 0.06 (0.01, 0.29) | <0.001 |  |
| Age (years) |  |  |  | 0.476 |
| ≤60 | 227/222 | 0.07 (0.01, 0.34) | 0.001 |  |
| >60 | 207/212 | 0 (0, 1.08) | 0.055 |  |
| Smoking status |  |  |  | 0.124 |
| No | 169/327 | 0.20 (0.11, 0.37) | 0.001 |  |
| Yes | 265/107 | 0.19 (0.09, 0.39) | <0.001 |  |
| Alcohol drinking status |  |  |  | 0.354 |
| No | 253/367 | 0.24 (0.14, 0.42) | 0.001 |  |
| Yes | 181/67 | 0.16 (0.07, 0.37) | <0.001 |  |
| HBsAg (+) |  |  |  | 0.266 |
| No | 66/366 | 0.26 (0.12, 0.58) | 0.001 |  |
| Yes | 368/51 | 0.22 (0.13, 0.39) | 0.001 |  |
| History of fatty liver disease |  |  |  | 0.254 |
| No | 339/375 | 0.25 (0.16, 0.41) | <0.001 |  |
| Yes | 95/52 | 0.09 (0.02, 0.38) | 0.003 |  |
| History of diabetes |  |  |  | 0.253 |
| No | 378/390 | 0.25 (0.16, 0.41) | <0.001 |  |
| Yes | 56/44 | 0 (0, 0.18) | 0.008 |  |

BMI: Body mass index; CI: Confidence interval; HBsAg: Hepatitis B surface antigen; HCC: Hepatocellular carcinoma; HEI-2015: Healthy Eating Index 2015; OR: Odds ratio; SD: Standard deviation. \*Adjusted for sex, age, total energy intake, BMI, smoking status, alcohol drinking status, HEI-2015, HBsAg, history of fatty liver disease, and history of diabetes.

**Supplementary Table 3: Stratified analyses of associations between dietary copper intake and HCC risk.**

| **Characteristics** | **Cases/controls** | **OR (95% CI) \*** | ***P*trend value** | ***P*interaction value** |
| --- | --- | --- | --- | --- |
| **per-SD increase** |
| Sex |  |  |  | 0.256 |
| Women | 73/73 | 1.73 (0.41, 7.23) | 0.324 |  |
| Men | 361/361 | 0.81 (0.54, 1.20) | 0.562 |  |
| Age (years) |  |  |  | 0.326 |
| ≤60 | 227/222 | 0.85 (0.54, 1.33) | 0.312 |  |
| >60 | 207/212 | 3.85 (0.26, 56.80) | 0.248 |  |
| Smoking status |  |  |  | 0.658 |
| No | 169/327 | 1.02 (0.66, 1.56) | 0.855 |  |
| Yes | 265/107 | 0.94 (0.61, 1.45) | 0.813 |  |
| Alcohol drinking status |  |  |  | 0.205 |
| No | 253/367 | 0.93 (0.66, 1.31) | 0.898 |  |
| Yes | 181/67 | 1.07 (0.52, 2.18) | 0.428 |  |
| HBsAg (+) |  |  |  | 0.316 |
| No | 66/366 | 0.89 (0.55, 1.42) | 0.431 |  |
| Yes | 368/51 | 1.14 (0.69, 1.89) | 0.214 |  |
| History of fatty liver disease |  |  |  | 0.335 |
| No | 339/375 | 0.93 (0.67, 1.29) | 0.822 |  |
| Yes | 95/52 | 1.61 (0.50, 5.24) | 0.850 |  |
| History of diabetes |  |  |  | 0.215 |
| No | 378/390 | 0.89 (0.65, 1.22) | 0.695 |  |
| Yes | 56/44 | 2.20 (0.82, 5.87) | 0.204 |  |

BMI: Body mass index; CI: Confidence interval; HBsAg: Hepatitis B surface antigen; HCC: Hepatocellular carcinoma; HEI-2015: Healthy Eating Index 2015; OR: Odds ratio; SD: Standard deviation. \*Adjusted for sex, age, total energy intake, BMI, smoking status, alcohol drinking status, HEI-2015, HBsAg, history of fatty liver disease, and history of diabetes.

**Supplementary Table 4: Stratified analyses of associations between serum copper levels and HCC risk.**

| **Characteristics** | **Cases/controls** | **OR (95% CI)\*** | ***P*trend value** | ***P*interaction value** |
| --- | --- | --- | --- | --- |
| **per-SD increase** |
| Sex |  |  |  | 0.284 |
| Women | 73/73 | 7.04 (0.12, 410.36) | 0.111 |  |
| Men | 361/361 | 1.59 (1.06, 2.39) | 0.245 |  |
| Age (years) |  |  |  | 0.500 |
| ≤60 | 227/222 | 1.93 (1.23, 3.04) | 0.089 |  |
| >60 | 207/212 | 21.12 (0.36, 1230.33) | 0.311 |  |
| Smoking status |  |  |  | 0.776 |
| No | 169/327 | 1.98 (1.56, 2.52) | <0.001 |  |
| Yes | 265/107 | 2.18 (1.60, 2.98) | <0.001 |  |
| Alcohol drinking status |  |  |  | 0.514 |
| No | 253/367 | 2.05 (1.66, 2.55) | <0.001 |  |
| Yes | 181/67 | 2.08 (1.35, 3.20) | 0.003 |  |
| HBsAg (+) |  |  |  | 0.167 |
| No | 66/366 | 3.15 (2.15, 4.62) | <0.001 |  |
| Yes | 368/51 | 1.65 (1.30, 2.09) | <0.001 |  |
| History of fatty liver disease |  |  |  | 0.147 |
| No | 339/375 | 2.16 (1.74, 2.67) | <0.001 |  |
| Yes | 95/52 | 1.84 (1.17, 2.90) | 0.017 |  |
| History of diabetes |  |  |  | 0.555 |
| No | 378/390 | 2.18 (1.76, 2.71) | <0.001 |  |
| Yes | 56/44 | 1.73 (1.13, 2.66) | 0.023 |  |

BMI: Body mass index; CI: Confidence interval; HBsAg: Hepatitis B surface antigen; HCC: Hepatocellular carcinoma; HEI-2015: Healthy Eating Index 2015: OR: Odds ratio; SD: Standard deviation. \*Adjusted for sex, age, total energy intake, BMI, smoking status, alcohol drinking status, HEI-2015, HBsAg, history of fatty liver disease, and history of diabetes.