**Supplementary tables**

**Supplementary Table S1. Demographic descriptive statistics of the subjects in the study**

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| Parameter | Case(n=30) | Control(n=31) |  |
| Count | Percent | Count | Percent | Sig. |
| Age(years) | 20-30 | 15 | 50.00  | 16 | 51.60  | 0.620 |
|  | 31-40 | 9 | 30.00  | 9 | 29.00  |  |
|  | 41-50 | 4 | 16.67  | 6 | 19.40  |  |
|  | >50 | 1 | 3.33  | 0 | 0.00  |  |
| Marriage | Yes | 13 | 46.67  | 15 | 48.39  | 0.544 |
|  | No | 15 | 50.00  | 13 | 41.94  |  |
|  | Others | 1 | 3.33  | 3 | 9.68  |  |
| Education | < BD | 25 | 86.67  | 26 | 83.87  | 0.646 |
|  | ≥BD | 4 | 13.33  | 5 | 16.13  |  |
| Smoking | Yes | 22 | 73.33  | 22 | 70.97  | 0.669 |
|  | No | 7 | 26.67  | 9 | 29.03  |  |
| Drinking | Yes | 16 | 53.33  | 16 | 51.61  | 0.783 |
|  | No | 13 | 43.33  | 15 | 48.39  |  |
| BMI | <18.5 | 1 | 3.33  | 3 | 9.70  | 0.452 |
|  | 18.5-25 | 24 | 83.33  | 15 | 48.40  |  |
|  | >25 | 4 | 16.67  | 13 | 41.90  |  |
| Abbreviations: BD=Bachelor's degree; BMI=Body mass index, (body mass in kg)/ (height in meters)2. Significance of differences was assessed by Chi-square tests. |

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| **Supplementary Table S2. Descriptive statistics of diet related parameters of all subjects** |
|  |  | Case(n=30) | Control(n=31) |  |
| Parameter | Count | Percent | Count | Percent | Sig. |
| Meat | Yes | 20 | 66.67  | 13 | 41.94  | 0.425 |
|  | No | 8 | 26.67  | 15 | 48.39  |  |
|  | not known | 2 | 6.67  | 3 | 9.68  |  |
| Yogurt | Yes | 22 | 73.33  | 25 | 80.65  | 0.808 |
|  | No | 5 | 16.67  | 3 | 9.68  |  |
|  | not known | 3 | 10.00  | 3 | 9.68  |  |
| Fried food | Yes | 16 | 55.17  | 11 | 35.48  | 0.016 |
|  | No | 11 | 37.93  | 18 | 58.06  |  |
|  | not known | 2 | 6.90  | 2 | 6.45  |  |
| High-fat food | Yes | 15 | 50.00  | 9 | 29.03  | 0.492 |
|  | No | 13 | 43.33  | 20 | 64.52  |  |
|  | not known | 2 | 6.67  | 2 | 6.45  |  |
| Fast food | Yes | 12 | 40.00  | 17 | 54.84  | 0.077 |
|  | No | 15 | 50.00  | 13 | 41.94  |  |
|  | not known | 3 | 10.00  | 1 | 3.23  |  |
| Spicy food | Yes | 19 | 63.33  | 14 | 45.16  | 0.086 |
|  | No | 8 | 26.67  | 15 | 48.39  |  |
|  | not known | 3 | 10.00  | 2 | 6.45  |  |
| Vegetarian | Yes | 22 | 84.62  | 12 | 70.59  | 0.230 |
|  | No | 3 | 11.54  | 5 | 29.41  |  |
|  | not known | 1 | 3.85  |  |  |  |
| Carnivorous | Yes | 20 | 80.00  | 13 | 76.47  | 0.209 |
|  | No | 4 | 16.00  | 3 | 17.65 |  |
|  | not known | 1 | 4.00  | 1 | 5.88  |  |
| Balance | Yes | 1 | 3.85  | 3 | 17.65  | 0.300 |
|  | No | 22 | 84.62  | 13 | 76.47  |  |
|  | not known | 3 | 11.54  | 1 | 5.88  | 　 |
| Eating patterns and food preference were recorded by a recall questionnaire of food intake in the last 4 weeks. Significant differences were assessed by Chi-square test. |

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| **Supplementary Table S3. Descriptive statistics of gut-related parameters for all subjects** |
|  |  | Case (n=30) | Control (n=31) |  |
| Parameter | Count | Percent | Count | Percent | Sig. |
| Constipation | Yes | 9 | 30.00  | 13 | 41.90  | 0.354  |
|  | No | 18 | 60.00  | 14 | 45.20  |  |
|  | not known | 3 | 10.00  | 4 | 12.90  |  |
| Diarrhea | Yes | 8 | 26.70  | 12 | 38.70  | 0.690 |
|  | No | 21 | 70.00  | 19 | 61.30  |  |
|  | not known | 1 | 3.33  |  |  |  |
| BSST | Type 1 | 12 | 41.38  | 11 | 35.48  | 0.394 |
|  | Type 2 | 2 | 6.90  | 3 | 9.68  |  |
|  | Type 3 | 3 | 10.34  | 1 | 3.23  |  |
|  | Type 5 | 6 | 20.69  | 4 | 12.90  |  |
|  | Type 6 | 4 | 13.79  | 5 | 16.13  |  |
|  | Type 7 | 2 | 6.90  | 7 | 22.58  |  |
| Stool color | Black | 5 | 17.24  | 5 | 16.13  | 0.696 |
|  | Red | 1 | 3.45  | 0 | 0.00  |  |
|  | Tawny | 18 | 62.07  | 22 | 70.97  |  |
|  | Golden | 5 | 17.24  | 4 | 12.90  |  |
| BSST (Bristol stool scale types): type 1: separate hard lumps like nuts (hard to pass); type 2: sausage-shaped but lumpy; type 3: sausage-shaped but with cracks on surface; type 5: soft blobs with clear-cut edges (passed easily); type 6: fluffy pieces with edges, mushy; type 7: watery, no solid pieces. Chi-square test results. |

**Supplementary Table S4. Alpha diversity indices**

|  |  |  |  |
| --- | --- | --- | --- |
| 　 | Shannon | Simpson | chao1 |
| Case | 3.15±0.20 | 0.93±0.02 | 1872.39±808.78 |
| Control | 3.29±0.24 | 0.94±0.03 | 2852.88±1097.80 |
| Sig. | 0.015 | 0.065 | 0.000 |

The diversity indices of two groups are shown as the mean±SD. Significance of differences was assessed by Mann Whitney U test.

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| **Supplementary Table S5. Diversity indices of dissimilarity tests for two groups** |
|  | ANOSIM | Sig. | MRPP | Sig. | adonis | Sig. |
| Case vs. Control | 0.13 | 0.003 | 0.47 | 0.003 | 0.08 | 0.004 |

Dissimilarity tests. Abbreviations: ANOSIM, analysis of similarity; MRPP, multiresponse permutation procedure; Adonis, nonparametric multivariate analysis of variance (MANOVA) with the adonis function.

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| **Supplementary Table S6. Total genes detected and diversity indices of functional genes in each group** |
| 　 | Genes detected | Shannon | Simpson |
| Case | 9434.74±1434.77 | 9.07±0.19 | 0.999877±0.000029 |
| Control | 11304.20±2499.12 | 9.25±0.22 | 0.999897±0.000024 |
| Sig. | 0.001 | 0.002 | 0.001 |

The diversity indices of two groups are shown as mean±SD (Standard Deviation). Significance of differences was assessed by Mann Whitney U test.

**Supplementary Figures**



**Supplementary Figure S1.** Shifts of functional genes involved in key metabolic pathways in inmates. The numbers of genes that exhibited significant differences as assessed by the Mann-Whitney U test between the inmates (case) and control groups are presented as a percentage in each category.



**Supplementary Figure S2.** Correlation between depression (SDS) and relative abundance of the genera *Prevotella*.The Spearman rank correlation (r) and probability (p) were used to evaluate statistical importance. SDS: Self-rating depression scale.