**Supplementary Table S2.** Pairwise PERMANOVA comparisons for age-BMI, age-diet, age-probiotics and age-gender combinations.

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| --- | --- | --- | --- |
| **Factor** | **Pairwise comparison** | **PREMANOVA p-value for Bacteria\*** | **PREMANOVA p-value for Fungi\*** |
| **BMI** | Young.Normal vs Older.Normal | 0.057 | 0.012 |
| Young.Overweight vs Older.Overweight | 0.005 | 0.008 |
| Young.Normal vs Young.Overweight | 0.572 | 0.916 |
| Older.Normal vs Older.Overweight | 0.628 | 0.077 |
| **Fiber Diet** | Young.Low vs Older.Low | 0.004 | 0.001 |
| Young.High vs Older.High | 0.037 | 0.012 |
| Young.Low vs Young.High | 0.076 | 0.158 |
| Older.Low vs Older.High | 0.361 | 0.807 |
| **Probiotics** | Young.Yes vs Older.Yes | 0.001 | 0.008 |
| Young.No vs Older.No | 0.009 | 0.001 |
| Young.Yes vs Young.No | 0.917 | 0.030 |
| Older.Yes vs Older.No | 0.166 | 0.462 |
| **Gender** | Young.Female vs Older.Female | 0.001 | 0.001 |
| Young.Male vs Older.Male | 1.000 | 0.178 |
| Young.Female vs Young.Male | 0.900 | 0.284 |
| Older.Male vs Older.Female | 0.983 | 0.160 |