The cooking method is extremely important for the production of low-salt, wet-marinated, fermented golden pomfret because it strongly influences its flavor components and organoleptic quality. There are also significant differences in flavor preferences in different populations. The present study analyzed differences in the aroma characteristics of wet-marinated fermented golden pomfret after boiling, steaming, microwaving, air frying and baking using a combination of an electronic nose, GC-IMS and SPME-GC-MS. Electronic nose PCA showed that the flavors of the boiled (A), steam (B) and microwave (C) treatment groups were similar, and the flavors of baking (D) and air frying (E) were similar. A total of 72 flavor compounds were detected in the GC-IMS analysis, and comparative analysis of the cooked wet-marinated and fermented golden pomfret yielded a greater abundance of flavor compounds. SPME-GC-MS analysis detected 108 flavor compounds, and the results were similar to the baking and air frying. Twelve key flavor substances, including hexanal, isovaleraldehyde, and (E)-2-dodecenal, were identified by orthogonal partial least squares discriminant analysis (OPLS-DA) and VIP analysis. These results show that cooking method is a key factor in the flavor distribution of wet-marinated fermented golden pomfret, and consumers can choose the appropriate cooking method accordingly.