

 **Citrus Fruits****Biomarker:** Proline Betaine

- **Sample type:** **Urine**
- **Significance:** The presence of proline betaine in urine is a reliable indicator of citrus fruit consumption. This biomarker helps in accurately assessing the intake of citrus fruits such as oranges and lemons, making dietary evaluations more precise.

 **Bananas****Biomarkers:** Dopamine and Serotonin Derivatives

- **Sample type:** **Blood (plasma) and urine**
- **Significance:** Metabolites such as dopamine and serotonin derivatives reflect banana consumption. These biomarkers help in distinguishing banana intake from other fruits, providing valuable data for dietary studies.

 **Smoked Meat****Biomarkers:** Syngol Metabolites

- **Sample type:** **Blood (plasma)**
- **Significance:** Syngol metabolites are specific to smoked meat intake. Their plasma detection accurately measures smoked meat consumption, aiding dietary assessments and health studies.

 **Red Meat****Biomarkers:** Amino Acids and Carnitine-Related Metabolites

- **Sample type:** **Blood (plasma)**
- **Significance:** Various amino acids and carnitine-related metabolites serve as indicators of red meat consumption. These biomarkers help in understanding dietary patterns and their health implications by providing objective data on red meat intake.

 **Fish****Biomarkers:** Omega-3 Fatty Acids (EPA, DHA)

- **Sample type:** **Blood (serum)**
- **Significance:** The presence of omega-3 fatty acids such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in blood is a strong indicator of fish consumption. These biomarkers are crucial for evaluating dietary habits and their impact on health, particularly in relation to cardiovascular health.

 **Whole Grains****Biomarkers:** Alkylresorcinols

- **Sample type:** **Blood (plasma)**
- **Significance:** Alkylresorcinols in plasma are reliable biomarkers for whole grain consumption, such as wheat and rye. These compounds help in accurately assessing the intake of whole grains, which are important for nutritional studies and dietary guidelines.

 **Coffee****Biomarkers:** Caffeine and Derivatives

- **Sample type:** **Urine and blood (plasma)**
- **Significance:** Caffeine and its metabolites in urine and blood indicate coffee intake. These biomarkers objectively measure coffee intake, aiding dietary habit studies and health impact assessments.