Karjalainen, Chen, 2023
Karjalainen, 2024
Schlosser, 2023
Yin, 2022
Tryptophan betaine
Glutamine
Cys-gly, oxidized
Decadienedioic acid (C10:2-DC)
1-palmitoyl-2-arachidonoyl-GPE (16:0/20:4)
1-stearoyl-2-oleoyl-GPE (18:0/18:1)
Epiandrosterone sulfate
Glyco-beta-muricholate
Lactosyl-N-nervonoyl-sphingosine (d18:1/24:1)
Tauro-beta-muricholate
Glutamine
Glycine
Isoleucine
Phenylalanine
Tyrosine
Valine
Alanine
Leucine
22:6 docosahexaenoic acid
18:2 linoleic acid
Creatinine
Diacylglycerol
Citrate
Glucose
Pyruvate
Lactate
Glycerol
3-Hydroxybutyrate
Cys-gly, oxidized
Cysteinylglycine
Cysteinylglycine disulfide
N-acetyl-aspartyl-glutamate (NAAG)
N,N,N-trimethyl-5-aminovalerate
2-hydroxy-4-(methylthio)butanoic acid
Homoarginine
Indoleacetoylcarnitine
Indoleacetylglutamine
Indoleacetylglycine
N-acetylarginine
N-acetylglutamate
N-acetylglutamine
N-acetylleucine
N-lactoyl phenylalanine
Homocarnosine
Picolinate
Taurocyamine
Galactonate
Lactose
2'-fucosyllactose
Quinolinate
Bilirubin (E,Z or Z,E)
Biliverdin
Succinylcarnitine (C4-DC)
1-palmitoyl-2-arachidonoyl-GPE (16:0/20:4)
1-palmitoyl-2-oleoyl-GPE (16:0/18:1)
1-palmitoyl-2-oleoyl-GPI (16:0/18:1)
1-stearoyl-2-arachidonoyl-GPE (18:0/20:4)
1-stearoyl-2-linoleoyl-GPE (18:0/18:2)
1-stearoyl-2-linoleoyl-GPI (18:0/18:2)
1-stearoyl-2-oleoyl-GPE (18:0/18:1)
1-stearoyl-2-oleoyl-GPI (18:0/18:1)
4-octenedioate
Decadienedioic acid (C10:2-DC)
Etiocholanolone glucuronide
Galactosylglycerol
Lactosyl-N-nervonoyl-sphingosine (d18:1/24:1)
Pregnanediol-3-glucuronide
Linoleoyl-arachidonoyl-glycerol (18:2/20:4)
1-oleoyl-2-arachidonoyl-GPE (18:1/20:4)
16a-hydroxy DHEA 3-sulfate
5alpha-androstan-3beta,17beta-diol disulfate
Andro steroid monosulfate C19H28O6S
Androstenediol (3alpha, 17alpha) monosulfate
Androstenediol (3beta,17beta) monosulfate
Androsterone sulfate
Choline phosphate
Epiandrosterone sulfate
Glyco-beta-muricholate
Nonenedioate (C9:1-DC)
Oleoyl-arachidonoyl-glycerol (18:1/20:4)
Phosphoethanolamine
Choline
1-(1-enyl-palmitoyl)-GPC (P-16:0)
Carnitine
Lactosyl-N-behenoyl-sphingosine (d18:1/22:0)
Palmitoyl sphingomyelin (d18:1/16:0)
Adenosine 3',5'-cyclic monophosphate (cAMP)
Guanosine-3',5'-cyclic monophosphate (cGMP)
Prolylglycine
Furaneol sulfate
3-hydroxyindolin-2-one sulfate
Beta-guanidinopropanoate
1-carboxyethylvaline
1-methyl-4-imidazoleacetate
1-ribosyl-imidazoleacetate
Glutamine
Homoarginine
Indole-3-propionic acid
Isovalerylcarnitine (C5)
N-acetyl-aspartyl-glutamate (NAAG)
Trans-urocanate
S-methylcysteine
2-hydroxy-4-(methylthio)butanoic acid
4-guanidinobutanoate
Threonine
Erythronate
Mannose
1,5-anhydroglucitol (1,5-AG)
Ascorbic acid 3-sulfate
Bilirubin (E,E)
N1-Methyl-2-pyridone-5-carboxamide
Quinolinate
Succinylcarnitine (C4-DC)
1-margaroyl-2-oleoyl-GPC (17:0/18:1)
1-oleoyl-2-linoleoyl-GPE (18:1/18:2)
1-palmitoleoylglycerol (16:1)
1-palmitoyl-2-linoleoyl-GPE (16:0/18:2)
1-palmitoyl-2-linoleoyl-GPI (16:0/18:2)
1-palmitoyl-2-oleoyl-GPI (16:0/18:1)
1-stearoyl-2-linoleoyl-GPE (18:0/18:2)
1-stearoyl-2-linoleoyl-GPI (18:0/18:2)
1-stearoyl-2-oleoyl-GPI (18:0/18:1)
5alpha-androstan-3beta,17alpha-diol disulfate
5alpha-androstan-3beta,17beta-diol disulfate
5alpha-androstan-3beta,17beta-diol monosulfate
Androsterone sulfate
Epiandrosterone sulfate
Hexadecenedioate (C16:1-DC)
Linoleoyl-linoleoyl-glycerol (18:2/18:2)
Myristoyl-linoleoyl-glycerol (14:0/18:2)
Oleoyl-linoleoyl-glycerol (18:1/18:2)
Oleoyl-oleoyl-glycerol (18:1/18:1)
Palmitoyl-oleoyl-glycerol (16:0/18:1)
Sphingomyelin (d18:1/20:1, d18:2/20:0)
Glyco-beta-muricholate
Lactosyl-N-nervonoyl-sphingosine (d18:1/24:1)
Lactosyl-N-palmitoyl-sphingosine (d18:1/16:0)
Carnitine
Etiocholanolone glucuronide
1-docosapentaenoyl-GPC (22:5n3)
1-palmitoyl-2-linoleoyl-GPC (16:0/18:2)
Arachidonate (20:4n6)
Lactosyl-N-behenoyl-sphingosine (d18:1/22:0)
Linoleoyl-arachidonoyl-glycerol (18:2/20:4)
Methylmalonate (MMA)
Oleoyl-arachidonoyl-glycerol (18:1/20:4)
Pyroglutamylglutamine
4-hydroxyphenylacetylglutamine
2,6-dihydroxybenzoic acid
Ethyl beta-glucopyranoside
Solanidine
Mannonate
IVW
MRpresso
MaxLik
Weighted Median
IVW
MRpresso
MaxLik
Weighted Median
IVW
MRpresso
MaxLik
Weighted Median
Effect size
> 0.2
0.1
0
−0.1
< −0.2
Pathway
Amino Acid
Energy
Lipid
Fatty Acid
Glycerides and phospholipids
Fluid Balance
Glycolysis
Carbohydrate
Ketone Body
Nucleotide
Cofactors and vitamins
Peptide
Xenobiotics
Bellenguez, 2022
Schwartzentruber, 2021
NMAFallNoUKB23