Supplementary Table. Significant metabolomic enriched pathways (FDR < 0.05) for serum metabolome from the second farm.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Metabolomic pathway name** | **Matched**  **metabolite**  **ratio** | **Metabolite** | ***P*-value** | **-Log(*P*-value)** | **False discovery rate (FDR)** | **Pathway impact value** |
| Arginine and proline metabolism | [15/36](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Arginine, Guanidinoacetate, Creatine, 4-Guanidinobutanoate, 4-Aminobutanoate, Spermidine, Spermine, trans-3-Hydroxy-L-proline, Hydroxyproline, L-Proline, L-Glutamate, L-Ornithine, 4-Acetamidobutanoate, Pyruvate and (S)-1-Pyrroline-5-carboxylate | 5.30ⅹ10-7 | 6.28 | 4.24ⅹ10-5 | 0.51 |
| beta-Alanine metabolism | [9/21](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | beta-Alanine, L-Aspartate, 3-Ureidopropionate, 5,6-Dihydrouracil, Carnosine, Spermine, Uracil, L-Histidine and Spermidine | 9.01ⅹ10-5 | 4.05 | 3.60ⅹ10-3 | 0.67 |
| Valine, leucine and isoleucine biosynthesis | [5/8](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Threonine, (S)-3-Methyl-2-oxopentanoic acid, L-Leucine, 2-Oxobutanoate and L-Valine | 4.35ⅹ10-4 | 3.36 | 9.94ⅹ10-3 | 0.00 |
| Histidine metabolism | [7/16](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Glutamate, Urocanate, L-Histidine, Carnosine, N-Methylhistamine, Methylimidazoleacetic acid and L-Aspartate | 4.97ⅹ10-4 | 3.30 | 9.94ⅹ10-3 | 0.52 |
| Alanine, aspartate and glutamate metabolism | [9/28](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Aspartate, L-Asparagine, D-Aspartate, L-Glutamate, 4-Aminobutanoate, L-Glutamine, (S)-1-Pyrroline-5-carboxylate, Succinate and Pyruvate | 1.13ⅹ10-3 | 2.95 | 1.47ⅹ10-2 | 0.62 |
| Glycine, serine and threonine metabolism | [10/34](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Serine, Choline, Guanidinoacetate, Glycine, L-Threonine, D-Serine, Creatine, L-Allothreonine, 2-Oxobutanoate and Pyruvate | 1.30ⅹ10-3 | 2.89 | 1.47ⅹ10-2 | 0.54 |
| D-Amino acid metabolism | [6/14](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | D-Glutamine, D-Aspartate, L-Serine, D-Ornithine, cis-4-Hydroxy-D-proline and D-Serine, | 1.48ⅹ10-3 | 2.83 | 1.47ⅹ10-2 | 0.00 |
| Arginine biosynthesis | [6/14](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Glutamate, L-Arginine, L-Aspartate, L-Citrulline, L-Ornithine and L-Glutamine | 1.48ⅹ10-3 | 2.83 | 1.47ⅹ10-2 | 0.48 |
| Phenylalanine metabolism | [5/10](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | Phenylacetaldehyde, L-Phenylalanine, 2-Hydroxyphenylacetate, L-Tyrosine and Phenylacetylglycine | 1.65ⅹ10-3 | 2.78 | 1.47ⅹ10-2 | 0.50 |
| Butanoate metabolism | [6/15](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | (R)-3-Hydroxybutanoate, Acetoacetate, 4-Aminobutanoate, L-Glutamate, Butanoic acid and Succinate | 2.26ⅹ10-3 | 2.65 | 1.72ⅹ10-2 | 0.14 |
| Pantothenate and CoA biosynthesis | [7/20](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | Pantothenate, 3-Ureidopropionate, 5,6-Dihydrouracil, L-Valine, L-Aspartate, beta-Alanine and Uracil | 2.37ⅹ10-3 | 2.63 | 1.72ⅹ10-2 | 0.12 |
| Phenylalanine, tyrosine and tryptophan biosynthesis | [3/4](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Phenylalanine, L-Tyrosine and 3-(4-Hydroxyphenyl)pyruvate | 3.77ⅹ10-3 | 2.42 | 2.52ⅹ10-2 | 1.00 |
| Tryptophan metabolism | [10/41](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | L-Tryptophan, N-Acetylserotonin, Serotonin, 5-Hydroxyindoleacetate, 5-Hydroxy-L-tryptophan, L-Kynurenine, Indole-3-acetaldehyde, Indolepyruvate, 5-Methoxyindoleacetate and Indole-3-acetate | 5.90ⅹ10-3 | 2.23 | 3.65ⅹ10-2 | 0.54 |
| Glycerophospholipid metabolism | [9/36](https://new.metaboanalyst.ca/Secure/pathway/PathResultView.xhtml) | Phosphatidylethanolamine, Phosphatidylcholine, 1-Acyl-sn-glycero-3-phosphocholine, Choline, Acetylcholine, Phosphatidylserine, sn-Glycero-3-phosphocholine, Phosphatidyl-N-dimethylethanolamine and sn-Glycero-3-phosphoethanolamine | 7.55ⅹ10-3 | 2.12 | 4.32ⅹ10-2 | 0.38 |