

Supplementary Materials.

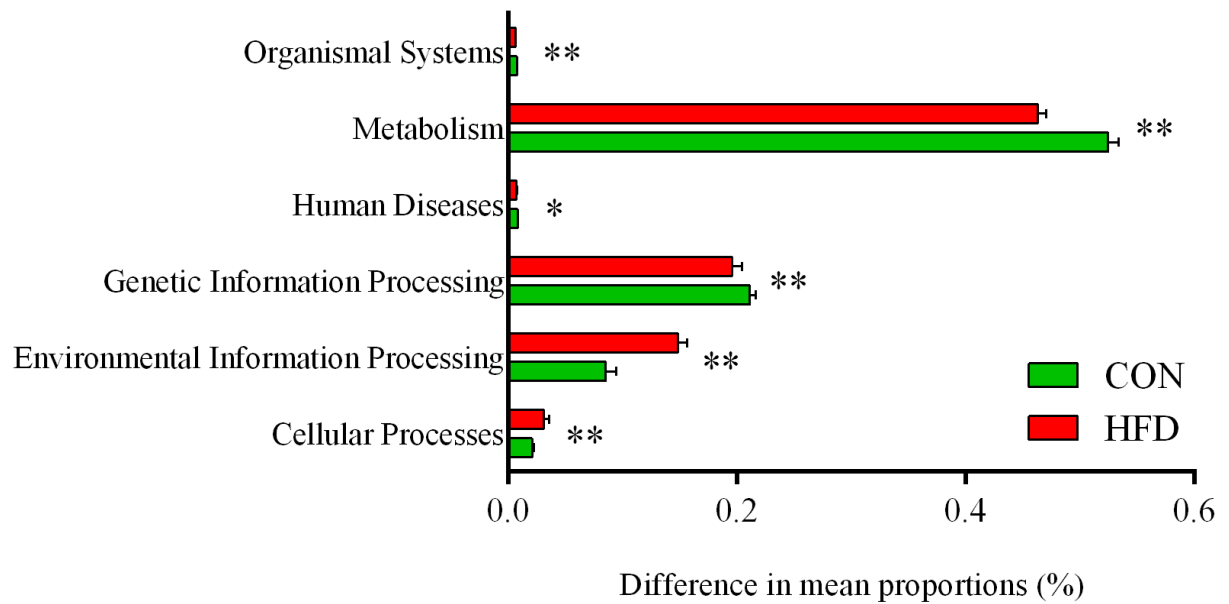


Figure S1. Distribution of level 1 KEGG functional categories from the CON (green) and HFD (red) groups.

To investigate the differences in microbial functions between the control group and HFD group, we adopted PICRUSt. Based on KEGG database, PICRUSt revealed a total of six biological metabolism pathways at Level 1 pathways: cellular processes, environmental information processing, genetic information processing, human diseases, metabolism, and organismal systems (Figure S1). Among them, metabolism, genetic information processing and environmental information processing dominated, accounting for 45.38–51.39%, 18.63–21.61% and 7.32–15.76%, respectively. These four pathways (metabolism, genetic information processing, human diseases, and organismal systems) in the HFD group were lower than those in the CON group. Meanwhile, the secondary function of the predicted gene was analyzed, finding it consisted of 24 sub-functions including amino acid metabolism, carbohydrate metabolism, replication and repair, membrane transport (Table S1). In further analysis, we identified 183 high microbial functions at category level 3 of the CON group ($p < 0.05$). In addition, 175 microbial functions were lower in the HFD group ($p < 0.05$) (Table S2).

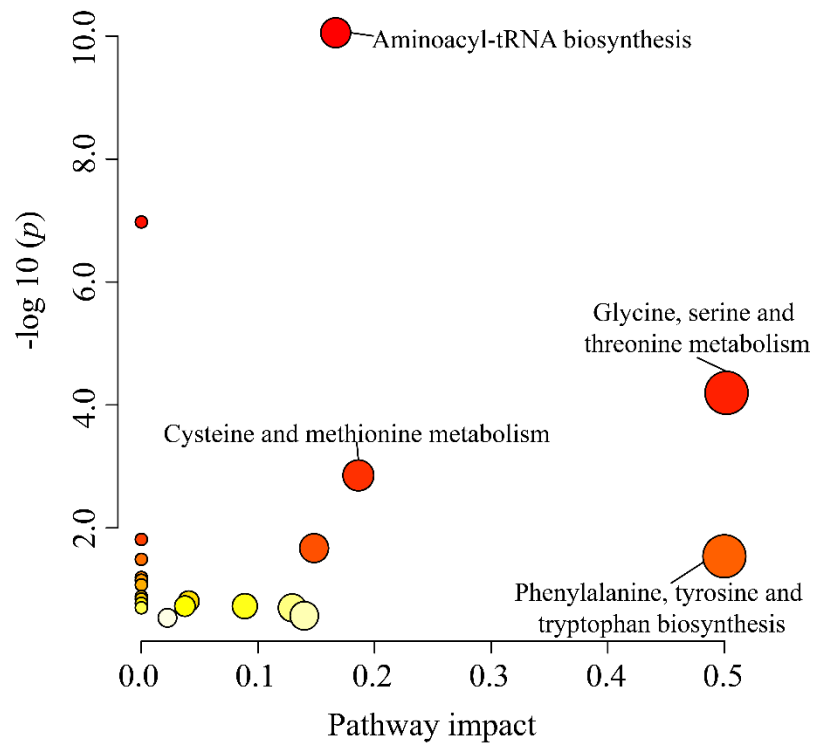


Figure S2. Summary of pathway analysis (serum).

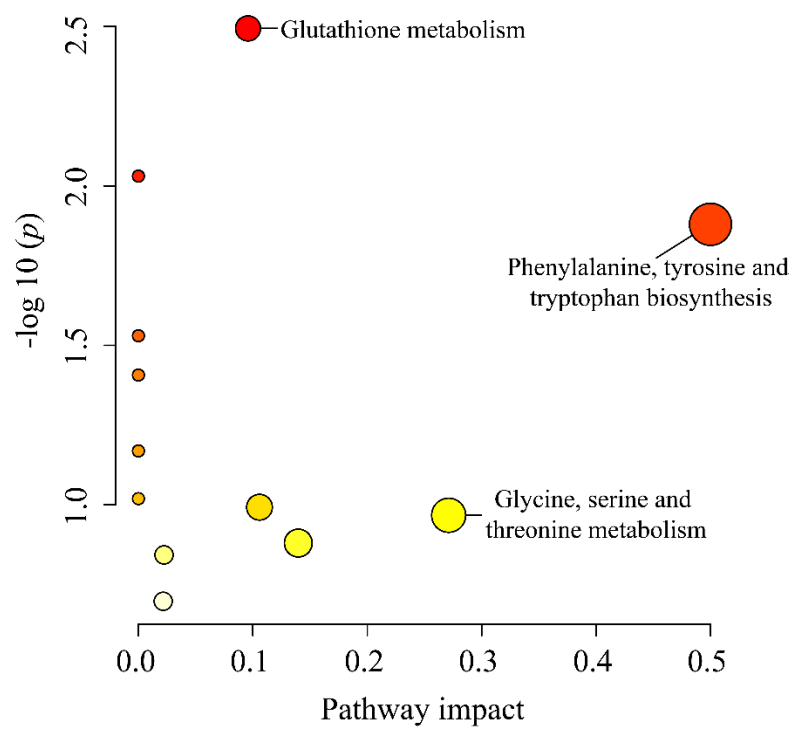


Figure S3. Summary of pathway analysis (fecal).

Table S3. Metabolic pathways affected by high fat diet on serum.

No.	Metabolic pathways	Total	Hits	$-\log(p)$	Impact
1	Aminoacyl-tRNA biosynthesis	48	8	10.05	0.17
2	Glycine, serine and threonine metabolism	34	4	4.20	0.50
3	Cysteine and methionine metabolism	33	3	2.85	0.19
4	Glyoxylate and dicarboxylate metabolism	32	2	1.67	0.15
5	Phenylalanine, tyrosine and tryptophan biosynthesis	4	1	1.54	0.50

Table S4. Metabolic pathways affected by high fat diet on fecal.

No.	Metabolic pathways	Total	Hits	$-\log(p)$	Impact
1	Glutathione metabolism	28	2	2.49	0.10
2	Phenylalanine, tyrosine and tryptophan biosynthesis	4	1	1.88	0.50

Table S5. Diet ingredients of control group.



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ANALYSIS RESULT

REPORTED March 25, 2021

Manufactured by : SajoDongAOne Corporation Ltd

USE : LAB Rodent Chow (steam autoclave) Sam #31

LOT NO. 400100

ASSAY	ANALYSIS	UNIT	LAB
NUTRIENTS			
PROTEIN(PROTEIN ANALYZER)	21.47	%	SajoDongA one
FAT (ACID HYDROLYSIS)	5.54	%	SajoDongA one
CALCIUM (EDTA)	0.81	%	SajoDongA one
PHOSPHORUS(COLORMETRIC)	0.72	%	SajoDongA one
ASH(FURNACE)	4.65	%	SajoDongA one
HEAVY METALS			
Pb	Not Detected	ppm	KFA
Cd	Not Detected	ppm	KFA
As	Not Detected	ppm	KFA
Se	Not Detected	ppm	KFA
Hg	0.0029	ppm	KFA
Cr	Not Detected	ppm	KFA
F	11.629	ppm	KFA
MYCOTOXINS			
Aflatoxin	Not Detected	ppb	KFA
Ochratoxin	Not Detected	ppb	KFA
Microbial Tests			
Salmonella	Not Detected		KFA
Carboncompound			
Melamine	Not Detected	ppm	KFA

*KFA : Korea Feed Association

This analysis report is issued for the purpose of quality control.

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CONFIRMED BY Ryu, Keun Hyung

Table S6. Diet ingredients of high fat diet group.

Product #D12492	gm%	kcal%
Protein	26.2	20
Carbohydrate	26.3	20
Fat	34.9	60
Total		100
Kcal/gm	5.24	
Ingredient	gm	kcal
Casein, 30 Mesh	200	800
L-Cystine	3	12
Corn Starch	0	0
Maltodextrin 10	125	500
Sucrose	68.8	275.2
Cellulose, BW200	50	0
Soybean Oil	25	225
Lard*	245	2205
Mineral Mix S10026	10	0
DiCalcium Phosphate	13	0
Calcium Carbonate	5.5	0
Potassium Citrate, 1 H ₂ O	16.5	0
Vitamin Mix V10001	10	40
Total	773.85	4057