Supplemental Table 1 Composition of basal diet (BD) (as fed)[1]

Ingredient	Content, *g/kg*
Corn	789.10
Roasted soybean	170.00
$CaCO_3$	12.05
$CaHPO_4$	20.00
L-lys·HCl	3.50
DL-Methionine	1.80
Threonine	2.60
Tryptophan	0.58
Salt	3.00
Choline chloride	2.00
premix[2]	5.00

[1]The Selenium content of basal diet is less than 0.02 ppm. [2]The premix consist of mineral and vitamin. Provided (per kg of diet): retinyl acetate, 8000IU; cholecalciferol, 1000IU; tocopheryl acetate, 10 mg; menadione, 0.5 mg; thiamine, 2 mg; riboflavin, 8 mg; D-pantothenic acid, 10 mg; niacin, 35 mg; folic acid, 0.55 mg; cyanocobal-amine, 0.01 mg, manganese 80 mg; iodine, 0.35 mg; iron ,80 mg; Copper, 8 mg; zine, 80 mg; colistin sulfate, 5 mg; aflatoxin, 12 mg.

Supplemental Table 2 Primers used for the Q-PCR of the target and reference genes.

Protein	Gene	Accession number	Primer pairs (5′ to 3′ direction)
		Selenoprotein genes	
GPX1	*Gpx1*	NM001277853.1	F：ACGGCGCATCTTCCAAAG R：TGTTCCCCCAACCATTTCTC
GPX2	*Gpx2*	NM001277854.1	F：CCCATCGCCAAGTCCTTCTA R：CACCTTCTCCCCCTGCAA
GPX3	*Gpx3*	NM001163232.2	F：GGCTTCCCCTCCAACCAA R：GCAGGGAGGATCTCGGAGTT
GPX4	*Gpx4*	NM204220.1	F：CTTCGTCTGCATCATCACCAA R：TCGACGAGCTGAGTGTAATTCAC
DIO1	*Dio1*	NM001097614.1	F：GGGCGAAAAGAGCAGAATGA R：GTGGGACCCCAGTTTTCGT
DIO2	*Dio2*	NM204114.3	F：GGCTGACTGCATGGACAACA R：TGCACACTCGCTCAAATGAAAC
DIO3	*Dio3*	NM001122648.1	F：GACCGGAGGGCTACAAGATCT R：TCTGGAGCCGGGTTTTGTAC
TrxR1	*Txnrd1*	NM001030762.2	F：TACGCCTCTGGGAAATTCGT R：CTTGCAAGGCTTGTCCCAGTA
TrxR2	*Txnrd2*	NM001122691.1	F：GCTCTTAAAGATGCCCAGCACTAC R：GAACAGCTTGAGCCATCACAGA
TrxR3	*Txnrd3*	NM001122777.1	F：CCTGGCAAAACGCTAGTTGTG R： CGCACCATTACTGTGACATCTAGAC
SelI	*Seli*	NM001031528.2	F：TGCCAGCCTCTGAACTGGAT R：TGCAAACCCAGACATCACCAT
SelK	*Selk*	NM001025441.2	F：GAAGAGGGCCTCCAGGAAAT R：CAGCCATTGGTGGTGGACTAG
SelM	*Selm*	NM001277859.1	F：ACATCCCGCTGTACCATAACCT R：TCTCCTCCCGGGTCATGTC
SelN	*Sepn1*	NM001114972.1	F：CAGGATCCATGCTGAGTTCCA R:GAGAGGACGATGTAACCCGTAAAC
SelO	*Selo*	NM001115017.1	F：CCAGCGTTAACCGGAATGAT R：ATGCGCCTCCTGGATTTCT
SelP	*Sepp1*	NM001031609.2	F：CCAAGTGGTCAGCATTCACATC R：ATGACGACCACCCTCACGAT
SelS	*Sels*	NM001024734.2	F：CCGACATGGTGGTAAGAAGACA R：GCTTGTGCATTCAACTCCTCTTG
SelT	*Selt*	NM001006557.3	F：AGGAGTACATGCGGGTCATCA R：GACAGACAGGAAGGATGCTATGTG
SelW	*Sepw1*	NM001166327.1	F：TGGTGTGGGTCTGCTTTACG

			R：CCAAAGCTGGAAGGTGCAA
SelX	*Selx*	NM001135558.1	F：TGGCAAGTGTGGCAATGG R：GAATTTGAGCGAGCTGCTGAAT
Sep15	*Sep15*	NM001012926.2	F：ACTTGGCTTCTCCAGTAACTTGCT R：GCCTACAGAATGGATCCAACTGA
SPS2	*Sephs2*	BG711010.1	F：CCGAGTGCGACAACATGCT R：GCTCCTCGTCCGTCATCTTCT
SelU	*Selu*	NM001193518.1	F：TTGGAGCATCGTGAGAAAGAATT R：CGGCAGCTTCAAGGACAGA
Insulin signal related genes			
Akt1	*Akt1*	NM205055.1	F：CACGCACTTTGTCACCTGAAG R：CCGCCTCCTAACCTTTGCTT
Braf	*Braf*	NM205302.1	F：CACAGATTCTTGCCTCCATTGA R：TGCACTGCGGTGAATTTTTG
Foxo1	*Foxo1*	NM204328.1	F：TCTGGTCAGGAGGGAAATGG R：GCTTGCAGGCCACTTTGAG
Hnf4A	*Hnf4A*	NM001030855.1	F：CGACCCAGATGCCAAAGG R：GGTACCGCATCCGCTTGAT
Hnf1A	*Hnf1A*	NM001030668.2	F：CACAGGCACCAGCGATACAT R：CGAGGGCCAGACTGAAGGT
Irs1	*Irs1*	NM001031570.1	F：CGGTCAGTCTGTCGTCCAGTAG R：GGAACCAGACACCGAAGCA
Ins	*Ins*	NM205222.2	F：CCAGCAGGAGGAATACGAGAA R：ACGTGTTATGGCAGCATTGC
Neurod1	*Neurod1*	NM_204920.1	F：TCAGCATCTACGGCAACTTCTC R：TGGTGAAGGCGTAGCTATTGTC
Pdx1	*Pdx1*	XM001234635.2	F：GAGCTGGCCGTCATGTTAAAC R：CCATTTCATCCGTCGGTTCT
Gcg	*GCG*	DQ185931.1	F：CAGACGAGCTCAGGATTTTGTG R：CCTGTCCTTGTTGGCCATTT
Ptpn1	*Ptpn1*	NM204875.1	F：CCAGAGTCTCCTGCTTCATTCC R：GGGTTAAGCGAGCCAGATTCT
Pi3k	*Pi3k*	U83109.1	F：CCTCGGAATTGGAGACAGACA R：ATGCCACCCGTCTCCTTGT
Foxa2	*Foxa2*	NM204770.1	F：GGGCCCGTAACGAACAAAA R：AAGAAGTCTCTCCGGCCAAAG
Slc2A2	*Slc2A2*	NM207178.1	F：CACACTATGGGCGCATGCT R：ATTGTCCCTGGAGGTGTTGGT
Ir	*Ir*	AF111857.1	F：TGAGACCCGACGCTGAGAATA R：GCCATCTGGATCATTTCTCTCAGT
Irs2	*Irs2*	XM425588.4	F：GCGACCAGTACGTGTTCATGA

			R：AGAACCGCTCCGCACATC
Ucp	*Ucp*	NM204107.1	F：CCTACGACCTCATCAAGGACACA R：GAAGGCAGCCACGAAGTGA
Housekeeping control genes			
β-actin	*Actb*	NM205518.1	F：ACCTGAGCGCAAGTACTCTGTCT R：CATCGTACTCCTGCTTGCTGAT
Gapdh	*Gapdh*	NM204305.1	F：TTGGCATTGTGGAGGGTCTT R：GGGCCATCCACCGTCTTC

Supplemental Table 3 Effects of high selenium diet on relative mRNA abundance of selenoprotein gene in three tissues of broilers compared with the control group at 6th wk.

Gene	Tissues	Control[1]	High Selenium[1]	*P* value
Dio1	liver	1.00±0.26	0.55±0.11	0.16
	pancreas	1.00±0.09	0.86±0.11	0.22
Dio2	liver	1.00±0.17	0.76±0.16	0.34
	pancreas	1.00±0.12	1.22±0.24	0.44
Dio3	liver	1.00±0.38	1.48±0.59	0.53
	muscle	1.00±0.21	0.98±0.12	0.20
Gpx2	liver	1.00±0.07	1.12±0.15	0.50
	pancreas	1.00±0.31	1.87±0.71	0.31
Gpx3	liver	1.00±0.24	0.63±0.16	0.25
	muscle	1.00±0.26	1.53±0.22	0.17
Gpx4	liver	1.00±0.23	0.53±0.13	0.13
	muscle	1.00±0.30	1.70±0.28	0.14
Seli	pancreas	1.00±0.17	1.32±0.43	0.51
Selo	liver	1.00±0.18	0.83±0.20	0.55
	pancreas	1.00±0.27	1.16±0.32	0.74
Sels	liver	1.00±0.10	0.71±0.11	0.11
	muscle	1.00±0.33	1.23±0.40	0.68
	pancreas	1.00±0.12	0.78±0.14	0.28
Selt	liver	1.00±0.15	0.85±0.16	0.53
	muscle	1.00±0.25	1.17±0.15	0.58
	pancreas	1.00±0.15	0.81±0.15	0.40
Selu	pancreas	1.00±0.16	1.07±0.25	0.83
Sepn1	pancreas	1.00±1.14	1.68±1.47	0.68
Sepp1	liver	1.00±0.25	0.61±0.14	0.22
Sepw1	pancreas	1.00±0.11	1.32±0.40	0.47
Selx	muscle	1.00±0.32	1.95±0.51	0.16
	pancreas	1.00±0.03	1.17±0.11	0.24
Sep15	liver	1.00±0.12	0.88±0.08	0.41
	muscle	1.00±0.24	1.59±0.28	0.16
	pancreas	1.00±0.12	0.88±0.17	0.59
Txnrd1	pancreas	1.00±0.23	1.11±0.28	0.76
Txnrd2	liver	1.00±0.20	0.86±0.23	0.66
	muscle	1.00±0.19	1.38±0.09	0.19
	pancreas	1.00±0.17	0.94±0.17	0.81
Txnrd3	pancreas	1.00±3.40	1.01±0.25	0.97

[1]Values are mean ± SE (n = 4).

Supplemental Table 4 Effects of high selenium diet on relative mRNA abundance of insulin signal-related gene in three tissues of broliers compared with the control group at 6th wk.

Gene	Tissues	Control[1]	High Selenium[1]	*P* value
Akt1	liver	1.00±0.05	1.07±0.21	0.77
Braf	liver	1.00±0.04	1.10±0.29	0.19
	muscle	1.00±0.16	1.38±0.19	0.18
	pancreas	1.00±0.07	0.79±0.14	0.23
Foxo1	liver	1.00±0.10	1.16±0.06	0.22
	pancreas	1.00±0.21	1.33±0.36	0.46
Foxa2	liver	1.00±0.10	0.98±0.15	0.91
	muscle	1.00±0.20	1.18±0.11	0.47
Gcg	pancreas	1.00±0.20	1.18±0.11	0.47
Hnf1A	liver	1.00±0.39	0.44±0.05	0.21
	muscle	1.00±0.22	0.70±0.15	0.31
	pancreas	1.00±0.20	0.85±0.25	0.65
Ins	liver	1.00±0.22	1.16±0.21	0.61
	muscle	1.00±0.19	1.36±0.29	0.34
Ir	liver	1.00±0.04	1.21±0.15	0.22
	pancreas	1.00±0.22	1.11±0.35	0.80
Irs2	liver	1.00±0.18	0.81±0.20	0.51
Neurad1	liver	1.00±0.16	1.01±0.18	0.97
	muscle	1.00±0.16	1.56±0.25	0.11
	pancreas	1.00±0.17	0.91±0.05	0.62
Pdx1	liver	1.00±0.22	1.44±0.33	0.31
	muscle	1.00±0.23	1.57±0.31	0.20
	pancreas	1.00±0.14	1.20±0.32	0.59
Pi3k	liver	1.00±0.11	0.90±0.22	0.70
Ptpn1	liver	1.00±0.09	1.25±0.15	0.20
	muscle	1.00±0.16	1.06±0.14	0.78
	pancreas	1.00±0.17	1.33±0.16	0.22
Ucp	liver	1.00±0.50	1.14±0.30	0.82
	muscle	1.00±0.30	0.47±0.09	0.15
Slc2A2	muscle	1.00±0.19	2.51±1.04	0.20
	pancreas	1.00±0.04	1.19±0.18	0.35

[1]Values are mean ± SE (n = 4).