Supplementary data

Supplemental tables

Supplemental Table 1. Composition and nutrient levels of the basal diet (as-fed basis)[a]

Item	Gestation	Lactation
Ingredients (%)		
Corn	63.53	62.89
Soybean meal	14.50	22.13
Soybean oil		2.00
Wheat bran	18.00	6.00
Fish meal		2.60
$_{L}$-Lysine HCl (98%)	0.05	0.27
$_{D, L}$- Methionine (99%)	0.02	0.13
$_{L}$-Threonine (98.5%)	0.05	
Limestone	1.15	0.98
Dicalcium phosphate	1.65	1.50
Choline chloride (50%)	0.15	0.15
Sodium chloride	0.40	0.40
Sodium bicarbonate		0.40
Vitamin and mineral premix	0.50 [b]	0.55 [c]
Total	100.00	100.00
Nutrient level [d]		
Digestible energy, Mcal/kg	3.04	3.27
Crude protein, %	14.03	17.50
Standard ideal digestible-Lysine, %	0.56	0.98
Total calcium, %	0.88	0.90
Total phosphorus, %	0.71	0.70

[a] Refer to Mou et al., (2020).[21]

[b] Vitamin and mineral mixture for gestation sows supplied the following amounts of vitamins/kg and minerals/kg of complete diet: 6000 IU vitamin A; 1500 IU vitamin D3; 80 IU vitamin E; 2.6 mg vitamin B1; 6.5 mg vitamin B2; 3.9 mg vitamin B6; 15 μg vitamin B12; 26 mg niacin; 1.3 mg folate; 120 mg iron; 20 mg copper; 120 mg zinc; 30 mg manganese; 0.3 mg iodine. Control, 0 mg selenium/kg (analysed value is 0.13 mg selenium/kg); Na_2SeO_3, 0.3 mg selenium/kg (analysed value is 0.41 mg selenium/kg); HMSeBA, 0.30 mg selenium/kg (analysed value is 0.46 mg selenium/kg).

[c] Vitamin and Mineral mixture for lactation sows supplied the following amounts of vitamins/kg and minerals/kg of complete diet: 6000 IU vitamin A; 1200 IU vitamin D3; 50 IU vitamin E; 1.0 mg vitamin B1; 3.6 mg vitamin B2; 1.8 mg vitamin B6; 12.5 μg vitamin B12; 20 mg niacin; 12.5 mg pantothenic acid; 2.0 mg folacin; 120 mg iron; 20 mg copper; 120 mg zinc; 30 mg manganese; 0.3 mg selenium; 0.3 mg iodine.

[d] Calculated according to Chinese Feed Database (2014).

Supplemental Table 2. Primer sequences of the target and reference genes

Genes	Primer	Sequence(5'→3')	Accession no.
GPX1	Forward	GATGCCACTGCCCTCATGA	AF532927
	Reverse	TCGAAGTTCCATGCGATGTC	
GPX2	Forward	AGAATGTGGCCTCGCTCTGA	DQ898282
	Reverse	GGCATTGCAGCTCGTTGAG	
GPX3	Forward	TGCACTGCAGGAAGAGTTTGAA	AY368622
	Reverse	CCGGTTCCTGTTTTCCAAATT	
GPX4	Forward	TGAGGCAAGACGGAGGTAAACT	NM_214407
	Reverse	TCCGTAAACCACACTCAGCATATC	
SEPP1	Forward	AACCAGAAGCGCCAGACACT	EF113596
	Reverse	TGCTGGCATATCTCAGTTCTCAGA	
TXNRD1	Forward	GATTTAACAAGCGGGTCATGGT	AF537300
	Reverse	CAACCTACATTCACACACGTTCCT	
TXNRD2	Forward	TCTTGAAAGGCGGAAAAGAGAT	GU181287
	Reverse	TCGGTCGCCCTCCAGTAG	
SEPW1	Forward	CACCCCTGTCTCCCTGCAT	NM_213977
	Reverse	GAGCAGGATCACCCCAAACA	
SEPHS2	Forward	TGGCTTGATGCACACGTTTAA	EF033624
	Reverse	TGCGAGTGTCCCAGAATGC	
SELO	Forward	CTTCCGACCCCAGATGGAT	AK236851
	Reverse	GGTTCGACTGTGCCAGCAT	
SOD1	Forward	GAGCTGAAGGGAGAGAAGACAGT	NM_001190422.1
	Reverse	GCACTGGTACAGCCTTGTGTAT	
SOD2	Forward	CTGGACAAATCTGAGCCCTAAC	NM_214127.2
	Reverse	GACGGATACAGCGGTCAACT	
CAT	Forward	CGAAGGCGAAGGTGTTTG	NM_214301.2
	Reverse	AGTGTGCGATCCATATCC	
Nrf2	Forward	AAGCCTTCAACCAAGACCA	XM_021075133.1
	Reverse	AGAATCACTGAAGCCAAGCA	
Keap-1	Forward	ACGACGTGGAGACAGAAACGT	XM_021076667.1
	Reverse	GCTTCGCCGATGCTTCA	
IL-1β	Forward	TCTGCCCTGTACCCCAACTG	NM214055.1
	Reverse	CCAGGAAGACGGGCTTTTG	
IL-6	Forward	GATGCTTCCAATCTGGGTTCA	M80258.1
	Reverse	CACAAGACCGGTGGTGATTCT	
IL-8	Forward	ACTTCCAAACTGGCTGTTGC	NM_213867.1
	Reverse	GGAATGCGTATTTATGCACTGG	
IL-10	Forward	GCCTTCGGCCCAGTGAA	NM_214041.1
	Reverse	AGAGACCCGGTCAGCAACAA	
IL-12	Forward	AAGCCCTCCCTGGAAGAACTGG	NM_213993.1
	Reverse	TCACCGCACGAATTCTGAAGGC	
TNF-α	Forward	TCTATTTTGGGATCATTGCCC	NM_214022.1
	Reverse	CCAGCCCCTCATTCTCTTTCT	
NF-κB	Forward	TGCTGGACCCAAGGACATG	AK348766.1
	Reverse	CTCCCTTCTGCAACAACACGTA	

TLR-2	Forward	TCGAAAAGAGCCAGAAAACCAT	NM213761
	Reverse	CTTGCACCACTCGCTCTTCA	
TLR-4	Forward	AGAAAATATGGCAGAGGTGAAAGC	GQ304754
	Reverse	CTTCGTCCTGGCTGGAGTAGA	
β-actin	Forward	AACTGGAACGGTGAAGGTGA	AY550069.1
	Reverse	CTTTTGGAAAGGCAGGGACT	

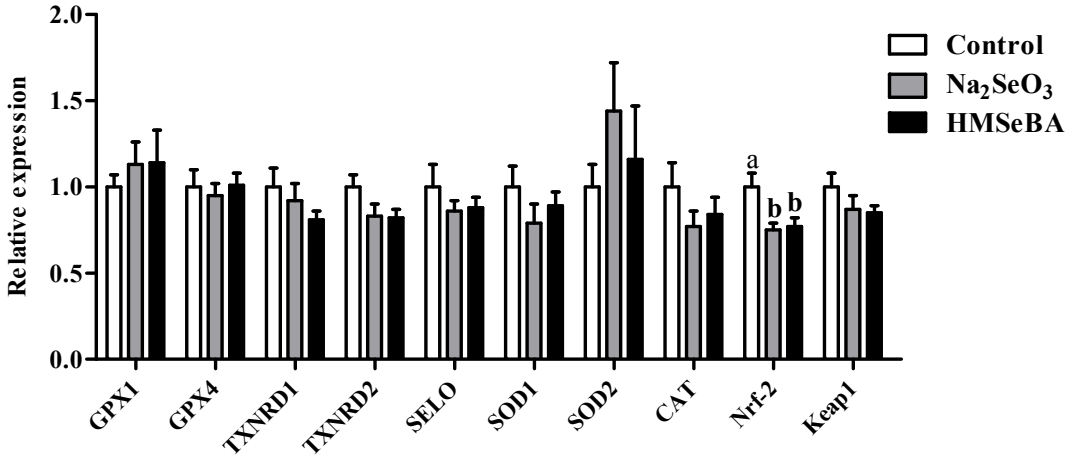
GPX, glutathione peroxidase; SEPP1 (SELP), selenoprotein P; TXNRD, thioredoxin reductase; SEPW1, selenoprotein W; SEPHS2, selenophosphate synthetase 2; SELO, selenoprotein O; SOD1, superoxide dismutase 1; SOD2, superoxide dismutase 2; CAT, catalase; Nrf2, nuclear erythroid 2-related factor 2; Keap1, Kelch-like ECH-associated protein 1; IL-1β, interleukin 1β; IL-6, interleukin 6; IL-8, interleukin 8; IL-10, interleukin 10; IL-12, interleukin 12; TNF-α, tumor necrosis factor -α; NF-κB, nuclear factor kappa B; TLR-2,Toll-like receptor-2; TLR-4,Toll-like receptor-4; β-actin, beta-actin.

Supplemental Table 3. Effect of maternal Se supplementation during gestation on temperature of weaned piglets

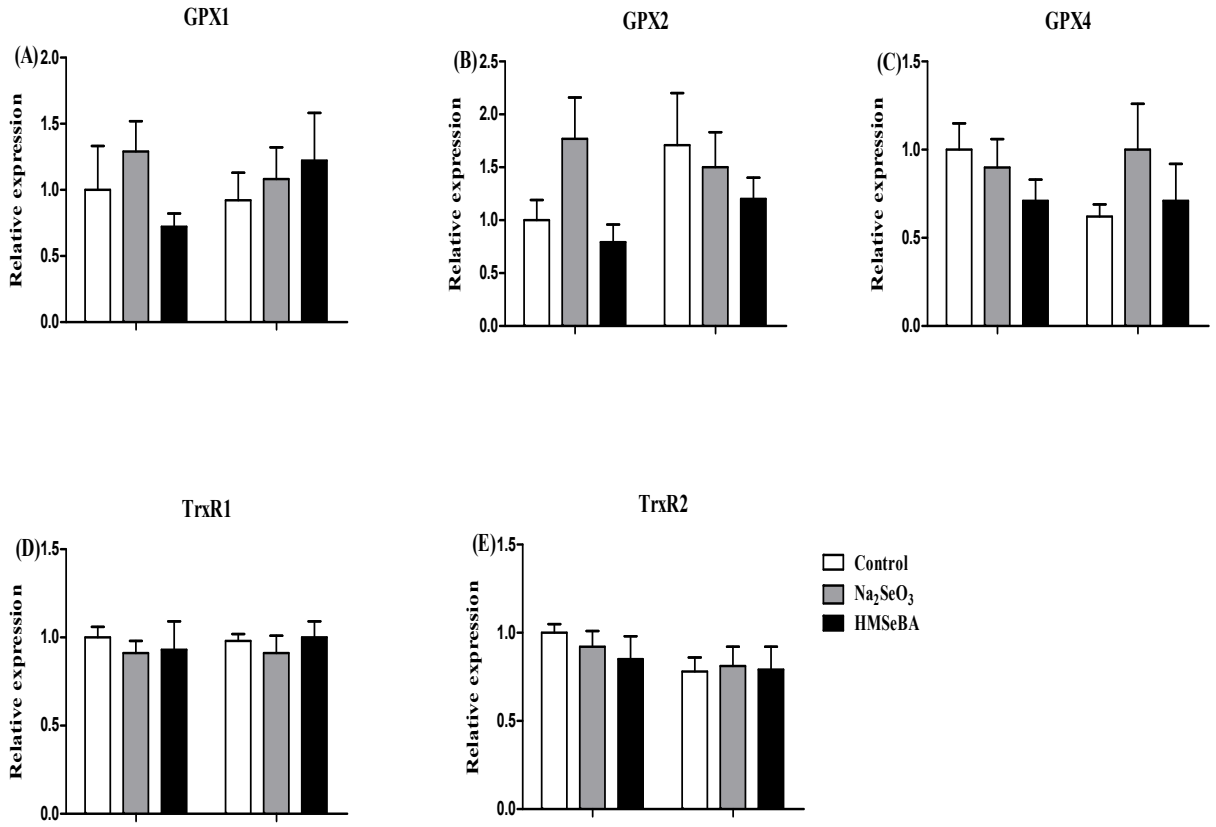
Time	Control		Na_2SeO_3		HMSeBA		SEM	*p*-Value		
	−LPS	+LPS	−LPS	+LPS	−LPS	+LPS		Diet	LPS	Diet*LPS
0 h (°C)	39.83	39.68	40.03	39.97	39.98	39.75	0.06	0.289	0.231	0.858
2 h (°C)	39.57^{b}	40.80^{a}	39.83^{b}	40.78^{a}	39.80^{b}	40.50^{a}	0.10	0.556	0.000	0.233
4 h (°C)	39.58^{b}	40.60^{a}	39.72^{b}	40.70^{a}	39.82^{b}	40.65^{a}	0.10	0.574	0.000	0.791

−LPS, piglets not challenged with LPS; +LPS, piglets challenged with LPS. Mean values with their standard errors, n = 6 for each group. Control, basal diet; Na_2SeO_3, 0.3 mg Se/kg of Na_2SeO_3; HMSeBA, 0.3 mg Se/kg of HMSeBA. ^{a,b} Values with different superscript letters within same row were significantly different ($p < 0.05$).

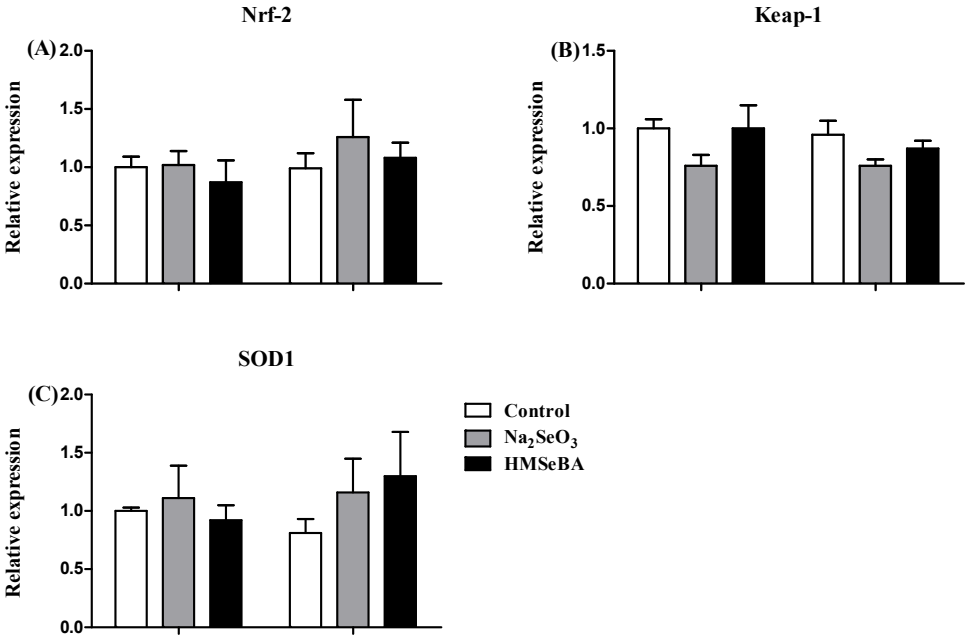
Supplemental Figures



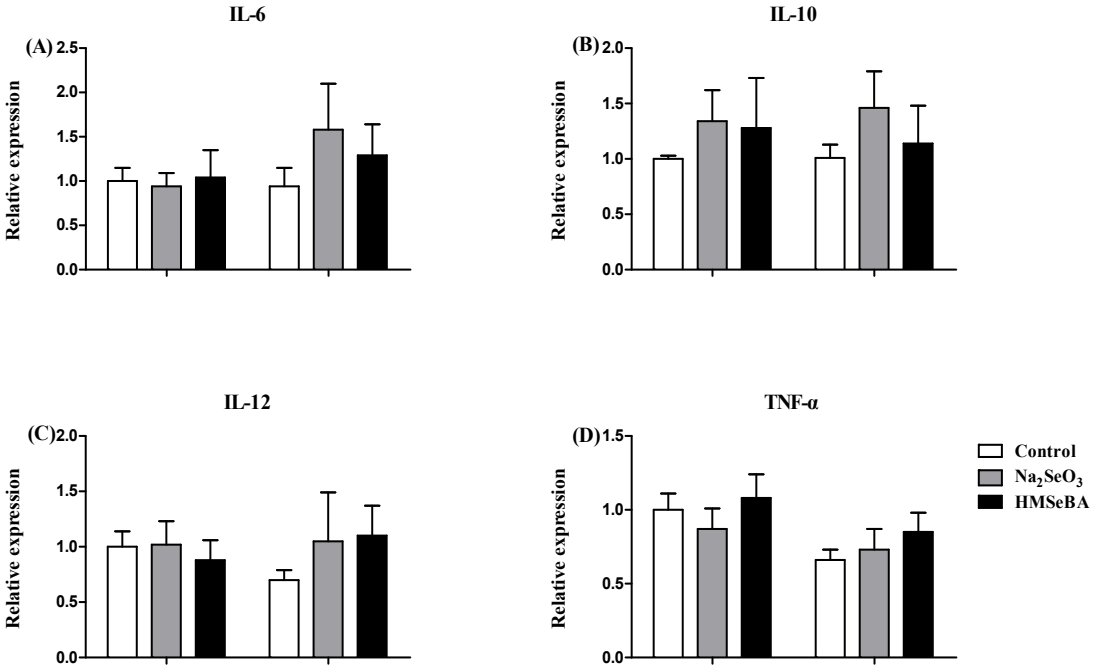
Supplemental Figure 1. Effect of maternal Se supplementation during gestation on expression of selenoprotein related genes and antioxidant activity related genes in newborn piglets' ileum. n = 10 for each group. Control, basal diet; Na2SeO3, 0.3 mg Se/kg of Na2SeO3; HMSeBA, 0.3 mg Se/kg of HMSeBA. GPX, glutathione peroxidase; TXNRD, thioredoxin reductase; SELO, selenoprotein O; SOD, superoxide dismutase; CAT, catalase; Nrf-2, nuclear erythroid 2-related factor 2; Keap1, Kelch-like ECH-associated protein 1. Mean values with standard errors are depicted by vertical bars. ^{a,b} Values with different superscript letters for same gene were significantly different ($p < 0.05$).



Supplemental Figure 2. Effect of maternal Se supplementation during gestation on expression of selenoprotein related genes in weaned piglets' ileum. n = 6 for each group. −LPS, piglets not challenged with LPS; +LPS, piglets challenged with LPS. (A) GPX1, (B) GPX2, (C) GPX4, (D) TrxR1, and (E) TrxR2 genes in weaned piglets' ileum. Control, basal diet; Na_2SeO_3, 0.3 mg Se/Kg of Na_2SeO_3; HMSeBA, 0.3 mg Se/Kg of HMSeBA. GPX, glutathione peroxidase; TXNRD, thioredoxin reductase. Mean values with standard errors are depicted by vertical bars.



Supplemental Figure 3. Effect of maternal Se supplementation during gestation on expression of antioxidant activity related genes in weaned piglets' ileum. n = 6 for each group. −LPS, piglets not challenged with LPS; +LPS, piglets challenged with LPS. (A) Nrf-2, (B) Keap-1, and (C) SOD1 genes in weaned piglets' ileum. Control, basal diet; Na_2SeO_3, 0.3 mg Se/kg of Na_2SeO_3; HMSeBA, 0.3 mg Se/kg of HMSeBA. Nrf-2, nuclear erythroid 2-related factor 2; Keap1, Kelch-like ECH-associated protein 1; SOD1, superoxide dismutase 1. Mean values with standard errors are depicted by vertical bars.



Supplemental Figure 4. Effect of maternal Se supplementation during gestation on expression of innate immune system related genes in weaned piglets' ileum. n = 6 for each group. −LPS, piglets not challenged with LPS; +LPS, piglets challenged with LPS. (A) IL-6, (B) IL-10, (C) IL-12, and (D) TNF-α genes in weaned piglet's ileum. Control, basal diet; Na_2SeO_3, 0.3 mg Se/kg of Na_2SeO_3; HMSeBA, 0.3 mg Se/kg of HMSeBA. IL-6, interleukin 6; IL-10, interleukin 10; IL-12, interleukin 12; TNF-α, tumor necrosis factor-α. Mean values with standard errors are depicted by vertical bars.