

Supplementary information

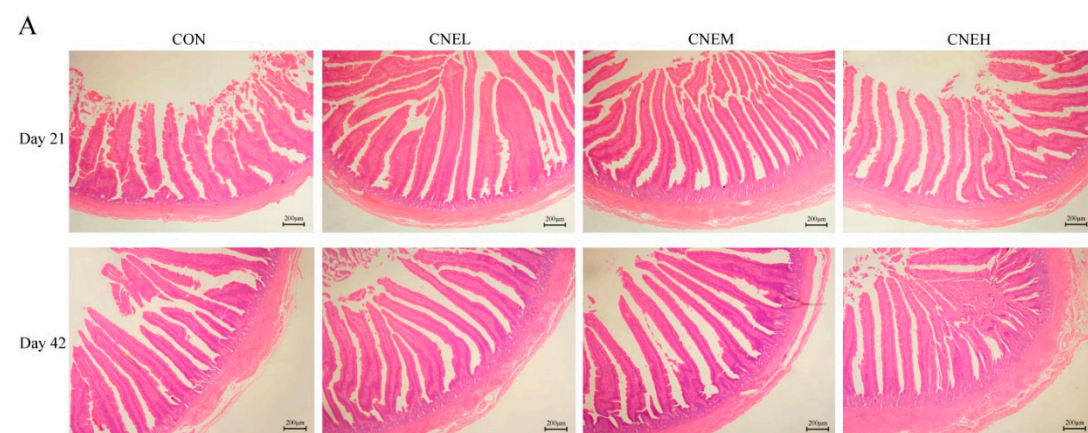


Figure S1: The jejunal tissues of broilers were stained with H&E. Scale bar: 200 μ m. (A) Microvillus morphology of the jejunum in 21- and 42-day-old broilers. CON, control group, basal diet; CNEL, the control diet + 300 mg/kg of CNE; CNEM, the control diet + 500 mg/kg of CNE; CNEH, the control diet + 700 mg/kg of CNE.

Table S1: The gradient elution procedure of HPLC.

Time (min)	mobile phase: A (%)	mobile phase: B (%)
0~10	40~50	60~50
10~15	50~60	50~40
15~25	60~70	40~30

Table S2: The commercial kits information.

Items	Name of kits	Cat. No.
Phenol	Plant total phenol test kit	A143-1-1
Flavonoid	Plant flavonoids test kit	A142-1-1
GH	Chicken growth hormone (GH) ELISA Kit	mIC60198-1
IGF-1	Chicken insulin-like growth factor 1 (IGF-1) ELISA kit	mIC60241-1
IgA	Chicken immunoglobulin A (IgA) ELISA kit	mIC60450-1
IgM	Chicken immunoglobulin M (IgM) ELISA kit	mIC60244-1
IL-6	Chicken interleukin-6 (IL-6) ELISA kit	mIC60293-1
IL-10	Chicken interleukin-10 (IL-10) ELISA kit	mIC60245-1
TNF- α	Chicken tumor necrosis factor- α (TNF- α) ELISA kit	mIC60499-1
MDA	Malondialdehyde (MDA) assay kit (TBA method)	A003-1-2
GSH-Px	Glutathione peroxidase (GSH-PX) assay kit (Colorimetric method)	A005-1-2
SOD	Superoxide Dismutase (SOD) assay kit (Hydroxylamine method)	A001-2-2
T-AOC	Total antioxidant capacity (T-AOC) assay kit (ABTS method)	A015-2-1

GH, growth hormone; IGF-1, insulin-like growth factor 1; IgA, immunoglobulin A; IgM, immunoglobulin M; IL-6, interleukin-6; IL-10, interleukin-10; TNF- α , tumor necrosis factor- α ; MDA, malondialdehyde; GSH-Px, glutathione peroxidase; SOD, superoxide dismutase; T-AOC, total antioxidant capacity.

Table S3: The ingredient and nutrient composition of the basal diet.

Component	Days 1~21	Days 22~42
Ingredient (%)		
Corn	55.21	62.21
Soybean meal	36.40	29.20
soybean oil	4.70	4.90
Limestone	1.52	1.60
CaHPO ₄	1.00	1.00
L-Lysine	0.35	0.30
Methionine	0.16	0.13
L-Threonine	0.06	0.06
Salt	0.30	0.30
Premix 1	0.30	0.30
Total	100.00	100.00
Nutrient levels 2		
Metabolic energy, MJ/kg	12.72	13.02
Curde protein, %	20.65	18.28
Lysine, %	1.27	1.09
Methionine, %	0.47	0.41
Calcium, %	0.90	0.91
Available P, %	0.54	0.52

1 Premix is supplied per kg of diet: vitamin A 12000 IU, vitamin D 32500 IU, vitamin E 20.0 mg, vitamin K3 3.0 mg, vitamin B1 3.0 mg, vitamin B2 8.0 mg, vitamin B6 7.0 mg, vitamin B12 0.03 mg, pantothenic acid 20.0 mg, niacin 50.0 mg, biotin 0.1 mg, folic acid 1.5 mg, Fe 45 mg, Cu 17.5 mg, I 1.5 mg, Zn 105 mg, Mn 124 mg, Se 15 mg.

2 Nutrient level is calculated value.

Table S4: Primers used for quantitative PCR.

Gene	Primer sequence (5'→3')	Accession number
β -actin	Forward: GAGAAATTGTGCGTGACATCA Reverse: ACCTCTGTCATCTCTCCACA	L08165.1
IL-1 β	Forward: CAGCCTCAGCGAAGAGACCTT Reverse: ACTGTGGTGTGCTCAGAATCC	NM_204524.2
IL-6	Forward: AAATCCCTCCTCGCCAATCT Reverse: CCCTCACGGTCTTCTCCATAAA	HM179640
IL-10	Forward: CGCTGTCACCGCTTCTTCA Reverse: TCCCGTTCTCATCCATCTTCTC	AJ621614
IFN- γ	Forward: AGCCGCACATCAAACACATA Reverse: CGCTGGATTCTCAAGTCGTT	NM_205149.1
TLR4	Forward: AGGCACCTGAGCTTTTCCTC Reverse: TACCAACGTGAGGTTGAGCC	NM_001030693.1
Myd88	Forward: ATCCGGACACTAGAGGGAGG Reverse: GGCAGAGCTCAGTGTCCATT	NM_001030962.1
NF- κ B	Forward: GTGTGAAGAAACGGGAAGCTG Reverse: GGCACGGTTGTCATAGATGG	NM_205129
CAT	Forward: GGTTCCGGTGGGGTGTCTTT Reverse: CACCAGTGGTCAAGGCATCT	NM_001031215.2
GSH-Px	Forward: GACCAACCCGCGAGTACATCA Reverse: GAGGTGCGGGCTTTCTTTA	NM_001277853.2
SOD1	Forward: ATTACCGGCTTGTCTGATGG Reverse: CCTCCCTTTGCAGTCACATT	NM_205064.155
Nrf2	Forward: CGCTTTCTTCAGGGGTAGCA Reverse: AGTTCGGTGCAGAAGAGGTG	NM_205117.1
HO-1	Forward: ACGAGTTCAAGCTGGTCACG Reverse: GGATGCTTCTTGCCAACGAC	NM_205344.1
NQO1	Forward: GGCAATGGCAGCAGCAG Reverse: AAGCACTCGGGGTCTTGAG	NM_001277621.1
IGF-2	Forward: CCTTCCTGGCCTATGCGTTG Reverse: TCACAGCTCCGAAAGCAGCA	NM_001030342
GH	Forward: TACGGCCTGCTGTCCTGCTT Reverse: TGTTTTTGGTGACGGGGAGG	NM_204359
GLP-2	Forward: AAGCTTCCCAGTCTGAACCA Reverse: ATCCTGAGCTCGTCTGCTGT	NM_001190165.3
Claudin-1	Forward: CTGCTCACCCCTCATTGGAG Reverse: GCTGAACTCACTCTTGGGCT	NM_001277622.1
Occludin	Forward: CCGTAACCCCGAGTTGGAT Reverse: ATTGAGGCGGTCGTTGATG	NM_205128.1
ZO-1	Forward: TGTAGCCACAGCAAGAGGTG Reverse: CTGGAATGGCTCCTTGTGGT	XM_413773.4
EAAT3	Forward: ACCCCCTTCTGATCACCTCT Reverse: TGAGCATGCTGATTCCAAAG	XM_424930.6

GLUT2	Forward: CCGCAGAAGGTGATAGAAGC	NM_205129.1
	Reverse: ATTGTCCCTGGAGGTGTT	
PePT1	Forward: TCACTGTTGGCATGTTCCCT	NM_204365.2
	Reverse: TTCGCATTGCTATCACCTA	

Abbreviations: IL-1 β : interleukin-1 β ; IL-6: interleukin-6; IL-10: interleukin-10; IFN- γ : interferon- γ ; TLR4: Toll-like receptor 4; Myd88: myeloid differentiation factor 88; NF- κ B: nuclear factor kappa B p65; CAT: catalase; GSH-Px: glutathione peroxidase; SOD1: copper and zinc superoxide dismutase; Nrf2: nuclear factor erythroid 2-related factor 2; HO-1: heme oxygenase-1; NQO1: NADPH dehydrogenase 1; IGF-2: insulin-like growth factor 2; GH: growth hormone; GLP-2: glucagon-like peptide 2; ZO-1: zonula occludens 1; EAAT3: excitatory amino acid transporter 3; GLUT2: glucose transporter 2; PePT1: peptide transporter 1.