

1 **Electronic Supplements**

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3 **Supplements figure captions**

4 Supplement figure 1. The extractable phosphorus ($\mu\text{mol/g DM}$) of wheat bran (WB)
5 with different treatments. Wheat bran (WB), wheat branfermented by *Saccharomyces*
6 *cerevisiae* without phytase (SC), 500 FTU phytase per kilogram wheat bran
7 (WB+phytase) and 500 FTU phytase per kilogram *Saccharomyces cerevisiae*
8 fermented wheat bran (FWB). ^{a,b}Means within the same rows without the same
9 superscript letter are significantly different ($P < 0.05$).

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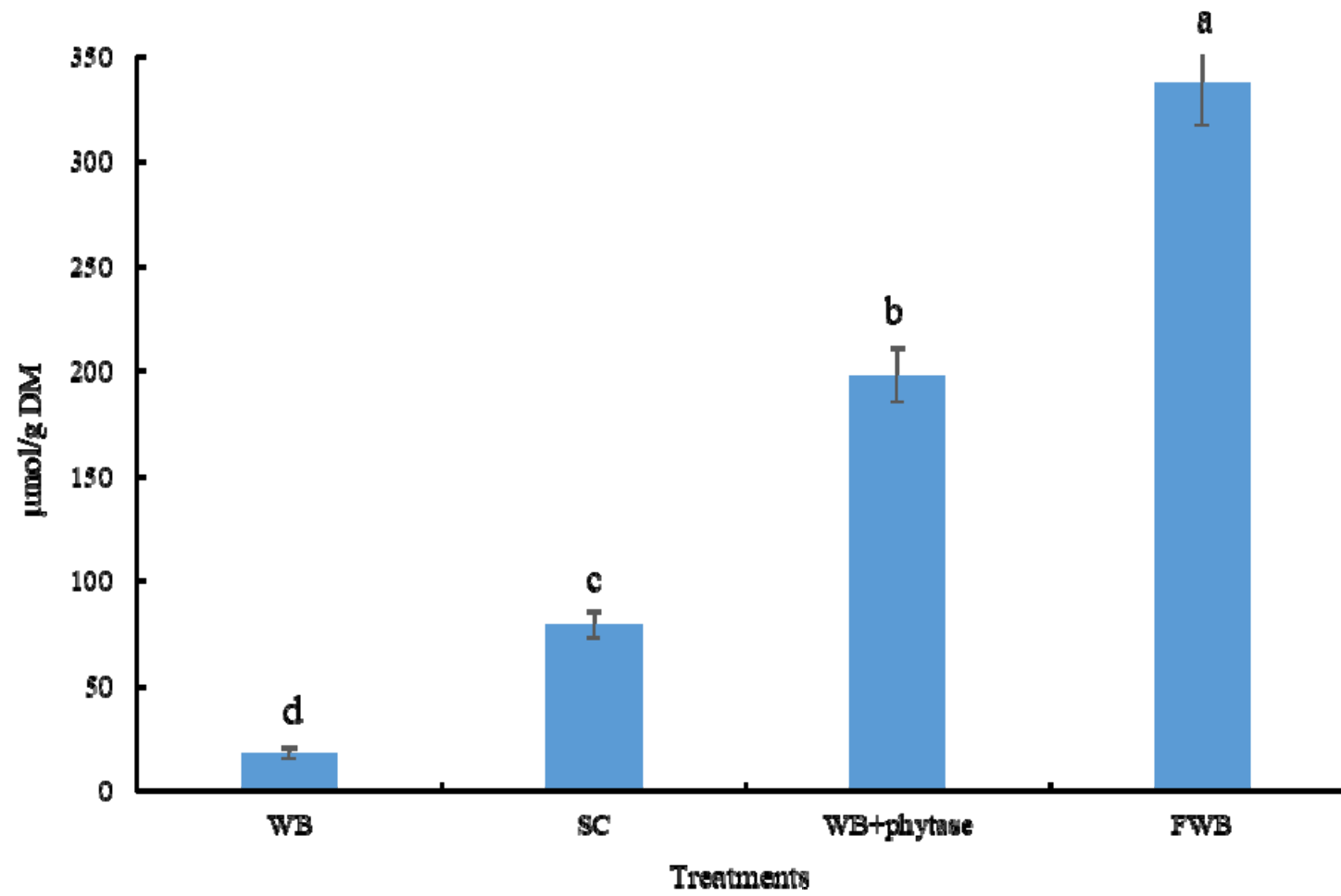
11 Supplement figure 2. Nitric oxide release amount of phosphate buffer solution (PBS,
12 control), 1 ng/ml lipopolysaccharide (LPBS, negative control), 50 mg/mL FWB
13 extraction and 1 ng/ml LPS included (50 mg/ml LFWB) and 100 mg/mL FWB
14 extraction and 1 ng/ml LPS included (100 mg/ml LFWB). ^{a,b}Means within the same
15 rows without the same superscript letter are significantly different ($P < 0.05$).

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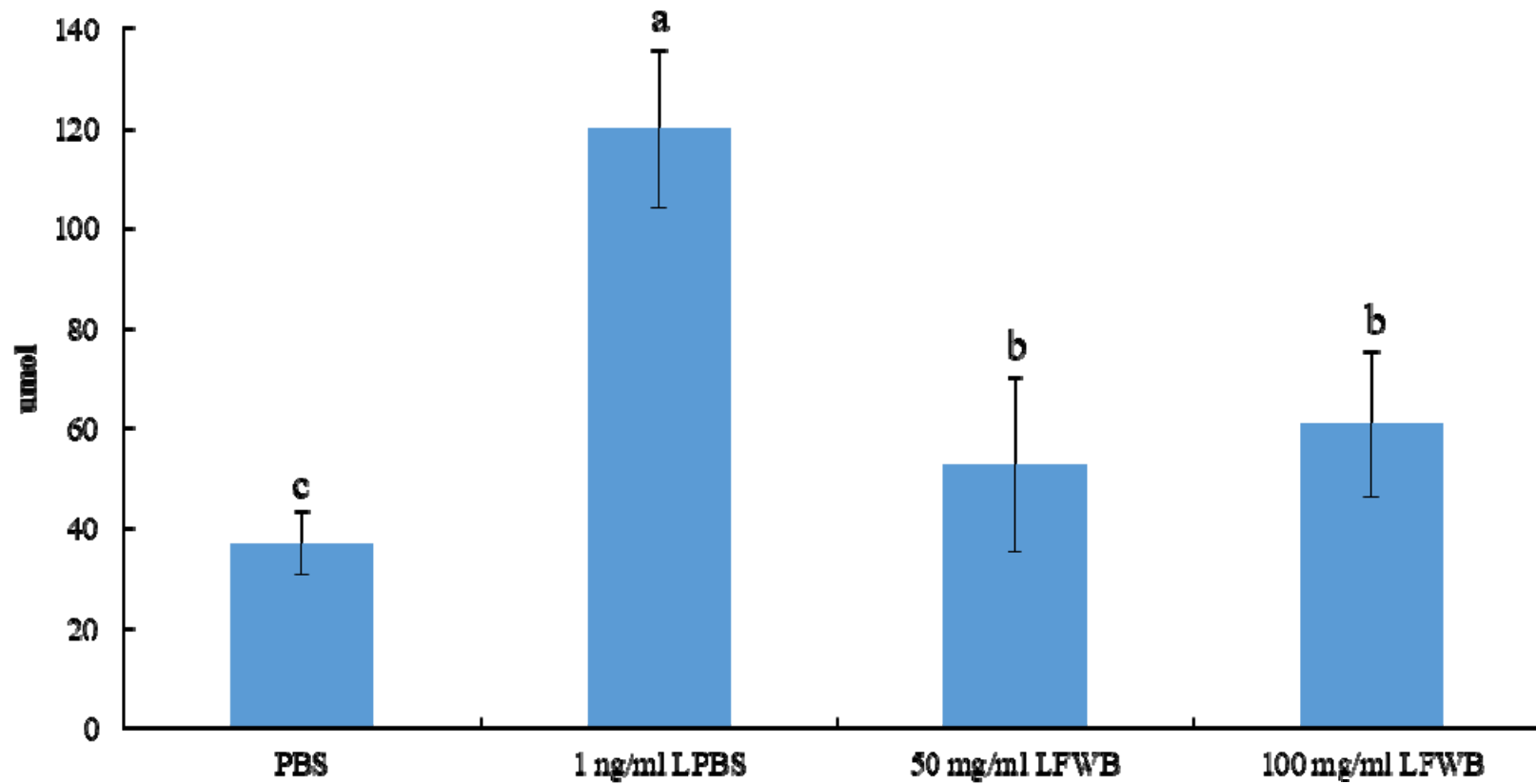
17 Supplement figure 3. MTT assay of phosphate buffer solution (PBS, control), PBS
18 and 1 ng/ml lipopolysaccharide (LPBS, negative control), 50 mg/mL FWB extraction
19 and 1 ng/ml LPS included (50 mg/ml LFWB) and 100 mg/mL FWB extraction and 1
20 ng/ml LPS included (100 mg/ml LFWB). ^{a,b}Means within the same rows without the
21 same superscript letter are significantly different ($P < 0.05$).

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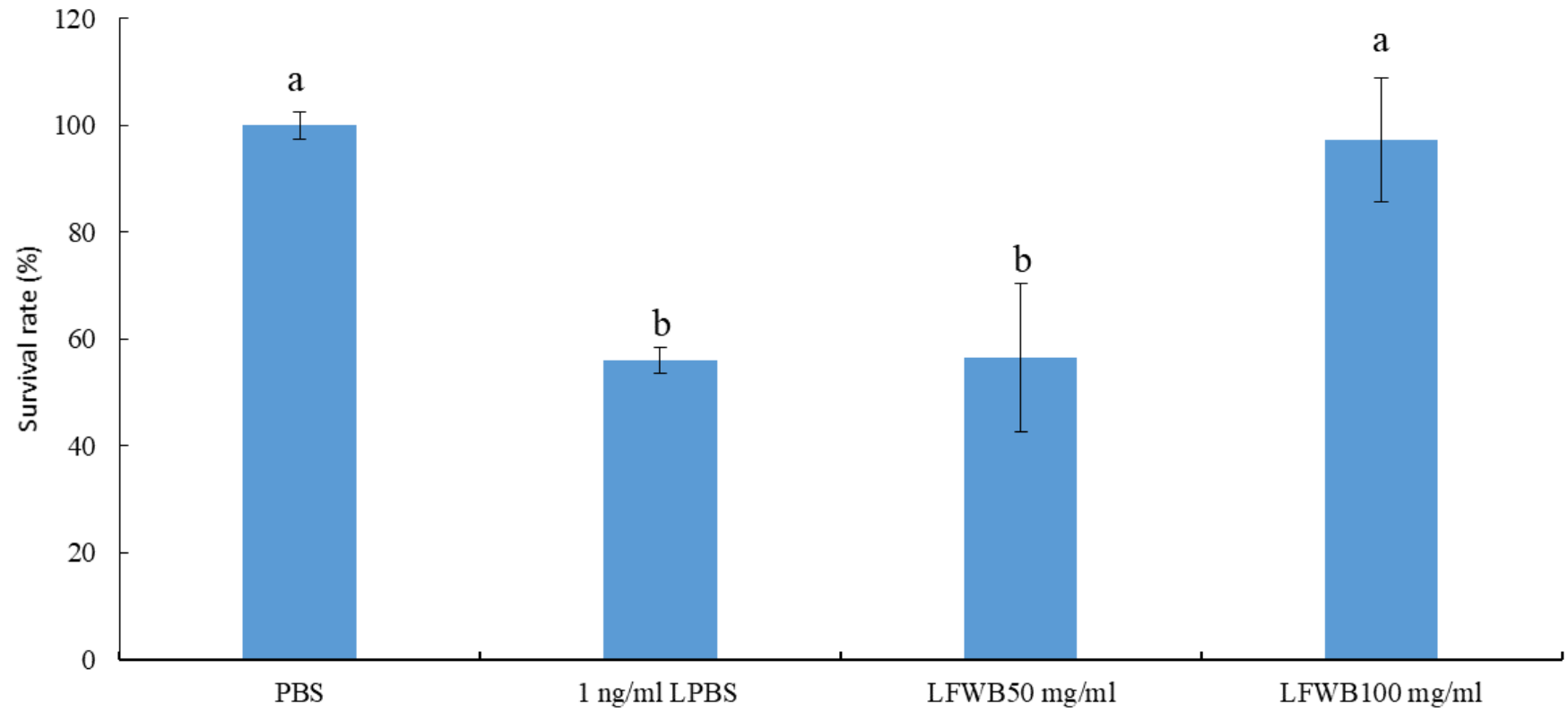
23 Supplement figure 4. Photomicrography of jejunum and ileum of 35-day-old broilers
24 fed with control, WB and FWB. (A-E) jejunum, respectively control, 5% WB, 5%
25 FWB, 10% WB, and 10% FWB. (F-J) ileum, respectively control, 5% WB, 5% FWB,
26 10% WB, and 10% FWB. Haematoxylin and eosin stain. 40 \times .



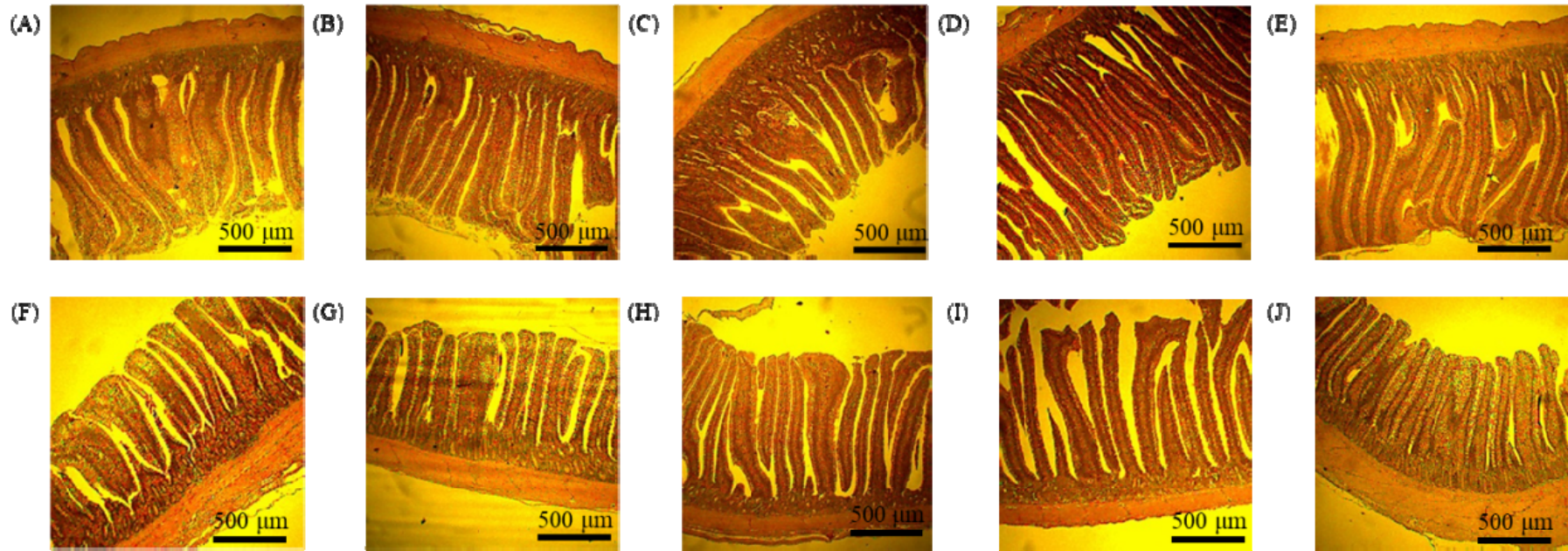
Supplement figure 1



Supplement figure 2



Supplement figure 3



Supplement figure 4

27 Supplement table 1. The primer sequence of each gene according to genbank.

Gene name ¹	Primer sequence	Genbank No.
β-actin	F: 5'-CTGGCACCTAGCACAATGAA-3' R: 5'-ACATCTGCTGGAAGGTGGAC-3'	X00182.1
MUC-2	F: 5'-GCTACAGGATCTGCCTTTGC-3' R: 5'-AATGGGCCCTCTGAGTTTTT-3'	JX284122.1
Occludin	F: 5'-GTCTGTGGGTTCCCTCATCGT-3' R: 5'-GTTCTTCACCCACTCCTCCA-3'	NM_205128.1
Claudin-1	F: 5'-GGAGGATGACCAGGTGAAGA-3' R: 5'-TCTGGTGTTAACGGGTGTGA-3'	NM_001013611.2
ZO-1	F: 5'-AGGTGAAGTGTTTCGGGTTG-3' R: 5'-CCTCCTGCTGTCTTTGGAAG-3'	XM_015278975.1
NOX-1	F: 5'-CAATGCAGCACTCCACTTTG-3' R: 5'-GACAAGATCTCCGCAAGACC-3'	NM_001101830.1
Nrf-2	F: 5'-GGAAGAAGGTGCGTTTCGGAGC-3' R: 5'-GGGCAAGGCAGATCTCTTCCAA-3'	NM_205117.1
HO-1	F: 5'-GGTCCCGAATGAATGCCCTTG-3' R: 5'-ACCGTTCTCCTGGCTCTTGG-3'	NM_205344.1
GCLC	F: 5'-CAGCACCCAGACTACAAGCA-3' R: 5'-CTACCCCAACAGTTCTGGA-3'	XM_419910.3
IL-6	F: 5'-AGGACGAGATGTGCAAGAAGTTC-3' R: 5'-TTGGGCAGGTTGAGGTTGTT-3'	NM_204628
iNOS	F: 5'-TACTGCGTGTCTTTCAACG-3' R: 5'-CCCATTCTTCTTCCAACCTC-3'	U46504
NFκB	F: 5'-CCAGGTTGCCATCGTGTTCC-3' R: 5'-GCGTGCGTTTGCCTTCT-3'	D13719.1
COX-2	F: 5'-TGTCCTTTCCTGCTTTCCAT-3' R: 5'-TTCCATTGCTGTGTTTGAGGT-3'	NM_001167718.1
IL-1β	F: 5'-GCTCTACATGTCGTGTGTGATGAG-3' R: 5'-TGTCGATGTCCCGCATGA-3'	NM_204524
IFN-γ	F: 5'-CTCCCGATGAACGACTTGAG-3' R: 5'-CTGAGACTGGCTCCTTTTCC-3'	Y07922

28 ¹ MUC2: Mucin2; ZO-1: Zonula occludens; NOX-1: NADPH oxidase-1; Nrf-2:
 29 Nuclear factor erythroid 2-related factor 2; HO-1: Heme oxygenase-1; GCLC:
 30 Glutamate-cysteine ligase catalytic; IL-6: Interleukin-6; iNOS: Inducible nitric oxide
 31 synthases; NFκB: Nuclear factor kappa B p 65; COX-2: Cyclooxygenase-2; IL-1β:
 32 Interleukin-1β; IFN-γ: Interferon-γ.

33 Supplement table 2. The enzyme activities, carbohydrate and proximate analysis of
 34 *Saccharomyces cerevisiae* and phytase co-fermented wheat bran (FWB).

	Products	
	WB ¹	FWB ²
Enzymes	-----U/g DM-----	
Xylanase ³	ND ⁴	152.76
Protease ⁵	ND	549.23
Cellulase ⁶	ND	289.49
β-glucanase ⁷	ND	147.07
Oligosaccharides	----- mg/g DM -----	
Pentose	75.3±0.38	193.80±19.99
Hexose	127.4±3.46	297.50±33.12
D-xylose	ND ³	16.01±1.24
Xylobiose	ND	21.47±1.89
Xylotriose	ND	16.23±3.11
Proximate analysis ⁸	reviewer idea:	
DM (%)	91.5±0.02	91.7±0.01
CP (% DM)	17.8±0.84	20.3±1.23
NDF (% DM)	42.4±1.64	44.9±0.16
ADF (% DM)	15.5±0.30	14.7±0.37
Ash (% DM)	5.15±0.08	5.90±0.37
EE (% DM)	4.08±0.02	4.24±0.05

35 ¹ WB: wheat bran.

36 ² FWB: *Saccharomyces cerevisiae* and phytase co-fermented wheat bran.

37 ³ One unit of xylanase activity is defined as 1 μmol D-xylose is generated from 10
 38 mg/ml xylan in the condition of 37°C and pH 5.5 in a minute.

39 ⁴No detectable.

40 ⁵One unit of protease activity is defined as 1 μg L-tyrosine is generated from 10
 41 mg/ml casein in the condition of 40°C and pH 7.5 in a minute.

42 ⁶ One unit of cellulase activity is defined as 1 μmol reducing sugar is generated from
 43 10 mg/ml CMC in the condition of 37°C and pH 5.5 in a minute.

44 ⁷ One unit of β-glucanase activity is defined as 1 μmol reducing sugar is generated
 45 from 5 mg/ml β-glucan in the condition of 37°C and pH 5.5 in a minute.

46 ⁸ DM: Dry matter; CP: Crude protein; NDF: Neutral detergent fiber; ADF: Acid
 47 detergent fiber; EE: Ether extra.