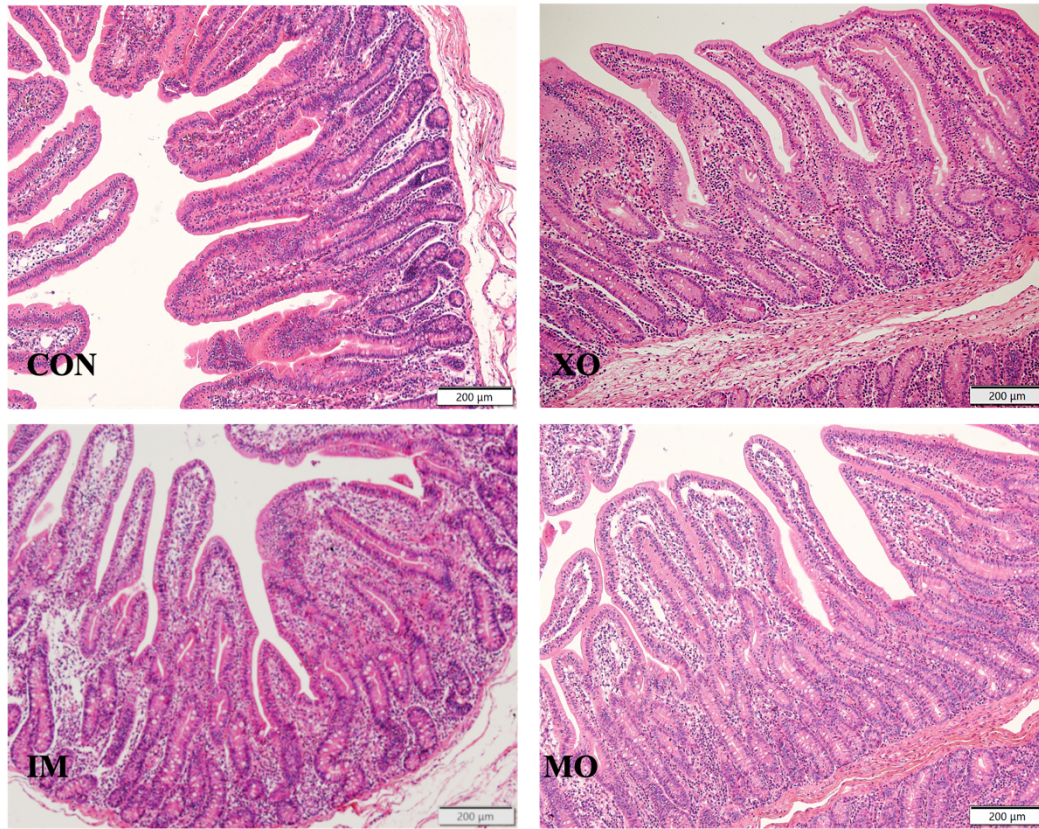**Supplementary Figure S1.** Effects of different functional oligosaccharides on intestinal microbial diversity in weanling piglets. (A) Ileal microbial α-diversity; (B) Colonic microbial α-diversity, (C) Ileal microbial β-diversity; (D) Colonic microbial β-diversity. CON, a control diet; XO, xylo-oligosaccharide diet; IM, isomaltose-oligosaccharide diet; MO, mannan-oligosaccharide diet; d, day. (n = 6) * means a significant difference ($p < 0.05$).

A

Supplementary Figure S2. Effects of different functional oligosaccharides on intestinal morphology in weanling pigs. (A) Jejunal morphology.

CON, a control diet; XO, xylo-oligosaccharide diet; IM, isomaltose-oligosaccharide diet; MO, mannan-oligosaccharide diet. n = 6 for each group.

Supplementary Table S1. Composition and nutrient levels of the experimental diets (%, as-fed basis).

Items	CON
Corn	56.45
Soybean meal	12.50
Whey powder	10.00
Fish meal	4.00
Soy protein concentrate	5.00
Extruded full-fat soybean	5.00
Sucrose	2.00
Soybean oil	1.30
Dicalcium phosphate	1.20
Limestone	0.75
NaCl	0.20
L-Lysine-HCl	0.45
DL-Methionine	0.20
L-Threonine	0.15
L-Tryptophan	0.10
L-Valine	0.20
Vitamins and trace minerals[1]	0.50
Nutrient levels, %	
Digestible energy, MJ/kg[2]	14.80
Crude protein	18.80
Total dietary fiber	16.27
Soluble dietary fiber	1.97
Insoluble dietary fiber	14.30
Calcium	0.80
Phosphorus	0.65

Notes: [1]Premix provided the following per kilogram of feed: vitamin A, 10,000 IU; vitamin D_3, 2,500 IU; vitamin E, 30 IU; vitamin K_3, 3 mg; vitamin B_1, 2.5 mg; vitamin B_2, 4.0 mg; vitamin B_6, 3.0 mg; vitamin B_{12}, 12 μg; nicotinic acid, 40 mg; thiamine, 3 mg; Riboflavin, 6 mg; D-pantothenic acid, 15 mg; folic acid, 1.2 mg; biotin, 50 μg; Fe, 90.0 mg; Zn, 75.0 mg; Mn, 40.0 mg; I, 0.35 mg; Se, 0.3 mg.

[2]Calculated Values.

Supplementary Table S2. All the primers sequences of target genes used for qRT-PCR assays.

Target gene	Primer forward/reverse	Primer sequence (5′→3′)
Mucin 1	Forward	GTGCCGACGAAAGAACTG
	Reverse	TGCCAGGTTCGAGTAAGAG
Mucin2	Forward	CTGTGTGGGGCCTGACAA
	Reverse	AGTGCTTGCAGTCGAACTCA
ZO-1	Forward	GCCATCCACTCCTGCCTAT
	Reverse	CGGGACCTGCTCATAACTTC
Occludin	Forward	CAGCAGCAGTGGTAACTTGG
	Reverse	ATAGTGGTCAGGGTCCGTCCTC
Claudin-1	Forward	AAGGACAAAACCGTGTGGGA
	Reverse	CTCTCCCCACATTCGAGATGAT T
Claudin-2	Forward	GCTGGCGAACGAGTTCTTAC
	Reverse	AGATGGCGCTAGATGTCACC
Claudin-4	Forward	TCAGCCCTGACTTTGCGTG
	Reverse	ACCTGTCTGTCCACACCAC
TNF-α	Forward	CCACGCTCTTCTGCCTACTGC
	Reverse	TCGGCTTTGACATTGGCTACAA
IL-1β	Forward	CCGCCAAGATATAACTGAC
	Reverse	GCAGCAACCATGTACCAA
IL-6	Forward	AATGCTCTTCACCTCTCC
	Reverse	CACACTTCTCATACTTCTCAC
IL-10	Forward	ACCTGGTAGAAGTGATGCC
	Reverse	CAAGGAGTTGTTTCCGTTA
pBD-1	Forward	TGCCACAGGTGCCGATCT
	Reverse	CTGTTAGCTGCTTAAGGAA
pBD-2	Forward	CCAGAGGTCCGACCACTACA
	Reverse	GGTCCCTTCAATCCTGTTGAA
GAPDH	Forward	TGGTGAAGGTCGGAGTGAAC
	Reverse	GGAAGATGGTGATGCGATTTC