Supporting Information

Supplemental tables

Table S1. Primer sequences for RT-qPCR analysis

Genes	Primers	Sequences (5'-3')	Size (bp)	Accession no.
GRP78	Forward	ACCAAAATCGCCTGACACCT	90	XM_001927795.5
	Reverse	TGCGCTCCTTGAGCTTTTTG		
IRE1α	Forward	GAGCAGCCTTAACCCACACT	80	XM_005668695.1
	Reverse	GTACCCGCCAGACACTCAAA		
eIF2α	Forward	GCGAAAACTAAAGATGGCGAGA	101	XM_005656337.1
	Reverse	AGACCCGGCATTCATAGAGT		
PERK	Forward	AGACTGTGACTTGGAGGACG	151	XM_003124925.4
	Reverse	GGATGCGTTATCACAGCCAG		
ATF4	Forward	TGGCGTATTAGAGGCAGCAG	146	NM_001123078.1
	Reverse	TTTGTCGGTTACAGCAACGC		
ATF6	Forward	CCGAAGAGAAGAGCCATCTG	127	XM_001924512.4
	Reverse	TCCTTTGATTTGCAGGGTTC		
CHOP	Forward	GTCATTGCCTTTCTCCTTCGG	139	NM_001144845.1
	Reverse	GGTTTTTGACTCCTCCTCATTTCC		
Caspase3	Forward	TGTGTGCTTCTAAGCCATGG	132	NM_214131.1
	Reverse	AGTTCTGTGCCTCGGCAG		
Bax	Forward	CTGACGGCAACTTCAACTGG	200	XM_003127290.5
	Reverse	CGTCCCAAAGTAGGAGAGGA		
Bcl-2	Forward	AGCATGCGGCCTCTATTTGA	120	XM_021099593.1
	Reverse	GGCCCGTGGACTTCACTTAT		
Akt	Forward	GCCAACAGAGACAGAGACCT	137	XM_005664751.3
	Reverse	TGCCATCGTCTGTGCTCTCA		
mTOR	Forward	CAGGCATACGGTCGAGACTTAA	112	XM_013998977.1
	Reverse	CGCCTGAACACGTGGTAATAGA		
TNF-α	Forward	CGTGAAGCTGAAAGACAACCAG	121	NM_214022.1
	Reverse	GATGGTGTGAGTGAGGAAAACG		
IL-1β	Forward	CGTGCAATGATGACTTTGTCTGT	112	NM_214055.1
	Reverse	AGAGCCTTCAGCATGTGTGG		

IL-10	Forward	TAATGCCGAAGGCAGAGAGT	122	NM_214041.1
	Reverse	GGCCTTGCTCTTGTTTTCAC		
Occludin	Forward	CTACTCGTCCAACGGGAAAG	158	NM_001163647.2
	Reverse	ACGCCTCCAAGTTACCACTG		
ZO-1	Forward	CAGAGACCAAGAGCCGTCC	171	XM_005659811.1
	Reverse	TGCTTCAAGACATGGTTGGC		
ZO-2	Forward	ATTCGGACCCATAGCAGACATAG	105	NM_001206404.1
	Reverse	GCGTCTCTTGGTTCTGTTTTAGC		
IGF-1R	Forward	CAACCTCCGGCCTTTTACTTT	135	U58370.1
	Reverse	CAGGAATGTCATCTGCTCCTT		
GLUT2	Forward	GACACGTTTTGGGTGTTCCG	149	NM_001097417.1
	Reverse	GAGGCTAGCAGATGCCGTAG		
SGLT1	Forward	GCAACAGCAAAGAGGAGCGTAT	137	NM_001164021.1
	Reverse	GCCACAAAACAGGTCATAGGTC		
β-actin	Forward	TCCATCGTCCACCGCAAATG	124	XM_003357928.2
	Reverse	TTCAGGAGGCTGGCATGAGG		

GRP78, glucose-regulated protein 78; PERK, protein RNA-like ER kinase; IRE1α, inositol-requiring enzyme 1α; ATF6, activating transcription factor 6; eIF2α, eukaryotic initiation factor 2α; ATF4, activating transcription factor 4; CHOP, C/EBP homologous protein; Akt, protein kinase B; mTORC1, mammalian target of rapamycin complex 1; Bcl-2, B-cell lymphoma 2; Bax, Bcl-2-associated X; TNF-α, tumor necrosis factor alpha; IL-1β, interleukin-1β; IL-10, interleukin-10; ZO-1, zonula occludens-1; ZO-2, zonula occludens-2; IGF-1R, insulin-like growth factor 1 receptor; GLUT2, glucose transporter 2; SGLT1, Na^+–glucose co-transporter 1

Table S2. Composition and nutrient levels of the basal diet for weaning piglets

Ingredient	Content, %	Nutrient content	Content
Maize	27.0	Digestible energy (Mcal/kg)	3.56
Extruded maize	23.8	CP (%)	19.5
Sucrose	3.00	Calcium (%)	0.76
Lactose	4.00	Available P (%)	0.47
Whey powder	10.0	Lys (%)	1.50
Extruded full-fat soybean	6.00	Met (%)	0.85
Dehulled soybean meal	6.00	Trp (%)	1.00
Soy protein concentrate	4.50	Thr (%)	0.26
Milk powder	5.00		
Fish meal	4.00		
Porcine plasma protein	3.50		
L-Lys-HCl	0.60		
DL-Met	0.25		
L-Thr	0.35		
L-Trp	0.05		
Choline chloride	0.15		
Limestone	0.80		
Monocalcium phosphate.H_2O	0.40		
Sodium chloride	0.15		
Mineral and vitamin premix*	0.45		
Total	100		

* Premix supplied the following per kg of diet: Cu ($CuSO_4.5H_2O$) 20mg, Fe ($FeSO_4.7H_2O$) 115 mg, Mn ($MnSO_4.H_2O$) 20 mg, Zn ($ZnSO_4.H_2O$) 115 mg, Se (Na_2SeO_3) 0.3 mg, I (KI) 0.3 mg; VA 8,000 IU; VD_3 2,000 IU; VE 25 IU; VK_3 1.2 mg; VB_1 2.5 mg; VB_2 6.5mg; VB_6 10 mg; VB_{12} 0.05 mg; biotin 0.15 mg; pantothenic acid 20 mg; niacin 45 mg; folic acid 1 mg.
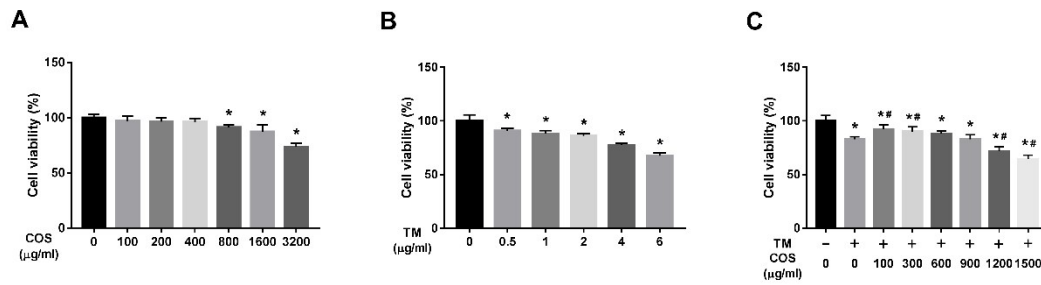
Supporting Figure Legends

Figure S1. Effects of COS or TM on cytotoxicity and viability of IPEC-J2 cells determined using the MTT assay. **(A)** Cell cytotoxicity of COS. (B) Cell cytotoxicity of TM. (C) Cell viability of COS co-treatment with TM. Data are expressed as means ± SEM, n=8. * *P < 0.05*, compared to blank control group; # *P < 0.05*, compared to TM control group.
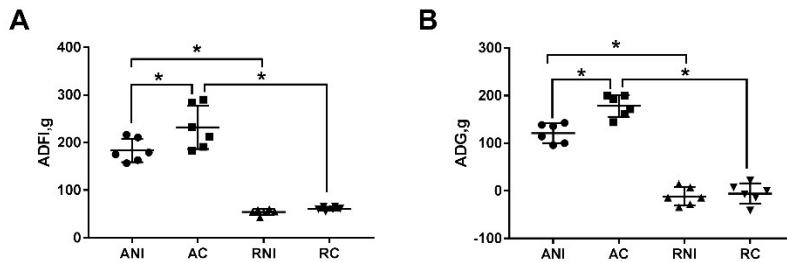

Figure S2. Effects of COS on growth performance in piglets with nutritional restriction. **(A)** ADFI, average daily feed intake. (B) ADG, average daily gain. Data are expressed as means ± SEM, n=7. * *P < 0.05*.