**Table S1** The ingredient and nutrient composition of different diets for weaning piglets.

|  |  |  |
| --- | --- | --- |
| **Item** | **NPD** | **LPD** |
|
| **Ingredients (kg/100kg)** |  |  |
|  Corn | 41.62  | 60.91  |
|  Cornstarch | 18.30  | 16.22  |
|  Soybean meal | 25.97  | 11.20  |
|  Fishmeal | 5.00  | 1.41  |
|  Soybean oil | 4.00  | 4.00  |
|  L-lysine | 0.70  | 1.30  |
|  DL-methionine | 0.23  | 0.34  |
|  L-threonine | 0.18  | 0.50  |
|  L-tryptophan | 0.01  | 0.12  |
|  Premixa | 4.00  | 4.00  |
|  Total | 100.00  | 100.00  |
| **Calculated nutrient levels** |  |  |
|  Digestible energy, Mcal/kg | 3.49  | 3.54  |
|  Crude protein, % | 18.83  | 13.05  |
|  Lysine, % | 1.52  | 1.51  |
|  Methionine + Cysteine, % | 0.83  | 0.74  |
|  Threonine,% | 0.91  | 0.92  |
|  Methionine,% | 0.55  | 0.54  |
|  Dry matter,% | 90.26  | 89.83  |
|  Tryptophan,% | 0.25  | 0.25  |

NPD, normal protein diet; LPD, low protein diet.

a The premix per kg contains vitamin A (KIU) 100-400, vitamin D3 (KIU) 25-215, vitamin E (mg) ≥ 300, vitamin K3 (mg) ≥ 30, vitamin B1 (mg) ≥ 25, vitamin B2 ≥ 75, vitamin B6 ≥ 35, vitamin B12 (mg) ≥ 0.25, niacin (mg) ≥ 400, pantothenic acid (mg) ≥ 300, folic acid (mg) ≥ 14, D-biotin (mg) ≥ 1.0, choline chloride (mg) ≥ 5,000, Cu (mg) 500-5,000, Fe (mg) 500-7,500, Zn (mg) 500-3,750, Mn (mg) 500- 3,750, I (mg) ≥ 3.0, Se (mg) 2.5-12.5, Ca (%) 10-20, total P (%) ≥ 1.5, sodium chloride (%) 5-14, arginine (%) ≥ 3.7, phytase (U) ≥ 20,000.

**Table S2** The primer sequences of colonic mucosal genes

|  |  |  |
| --- | --- | --- |
| **Gene** | **Primer sequence (5’-3’)** | **Accession number** |
|
| *β-actin* | F- ATGCTTCTAGACGGACTGCG | XM\_003357928.4 |
| R- GTTTCAGGAGGCTGGCATGA |
| *Glut2* | F- CCTGCTTGGTCTATCTGCTGTG | NM\_001097417.1 |
| R- TTGATGCTTCTTCCCTTTCTTT |
| *Sglt1* | F- CCACTTTCCCTATAAAACCTCAC | NM\_001164021.1 |
| R-CTCCATCAAACTTCCATCCTCAG |
| *Pept-1* | F- GATGAAATGTGAGCGTATGGG | NM\_214347.1 |
| R-AAAGAGGGAGGATCTGGAAAA |
| *Occludin* | F- ATGCTTTCTCAGCCAGCGTA | NM\_001163647.2 |
| R- AAG GTTCCATAGCCTCGGTC |
| *ZO-1* | F- GAGGATGGTCACACCGTGGT | XM\_021098896.1 |
| R- GGAGGATGCTGTTGTCTCGG |
| *IGF-1R* | F- GGGATGACGAGAGACATCTATGAG | XM\_021082920.1 |
| R- GAAGGACCAGACTCAGAGTGC |

**Figure S1**



**Figure S1** Effect of protein restriction and succedent realimentation on dominant genus of colonic digesta (A) and mucosa (B) in weaned piglets (n = 6). CON, control group; TRE, treatment group.