Supplementary information

1. Preparation of RTFP

Dried powder of *R. roxburghii* fruits was refluxed with 95% ethanol twice at 70 °C for 3 h to remove liposoluble compounds and impurities. The dried residue was extracted with distilled water with a liquid-to solid ratio of 30:1 (w/w) at 95 °C for 3 h. After extraction twice, the combined extracts were concentrated, which was then subjected to deproteinization and decolorization according to the previous methods. Then, the resulting solution was precipitated (12 h, 4 °C) by adding dehydrated ethanol to a final concentration of 80% (v/v). The precipitate was centrifuged, collected and lyophilized to obtain crude polysaccharides (RTFP). The chemical components and monosaccharide composition of RTFP are listed in Table S1 and Fig. S1.

Table S1 Chemical compositions of RTFP

Chemical composition (%, g/g)	RTFP
Carbohydrates	63.79 ± 0.73
Proteins	4.10 ± 0.58
Uronic acids	14.78 ± 0.06
Moisture	11.10 ± 0.25
Monosaccharide composition (molar%)	
Arabinose	33.8 ± 1.03
Galactose	37.3 ± 1.65
Glucose	20.7 ± 0.84
Mannose	1.74 ± 0.03
Xylose	3.43 ± 0.06
Fucose	2.95 ± 0.16

The results are mean ± standard deviation of duplicate analysis.

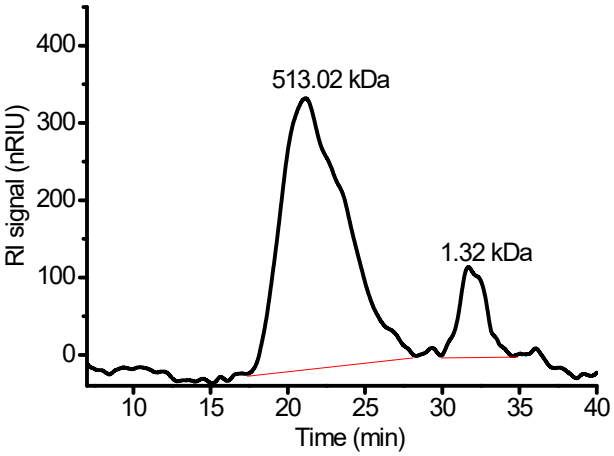

Fig.S1 The HPLC profile of molecular weight distribution of RTFP

Table S2 Feed formulation

Product code	HF60		LF10C	
	gm%	kcal%	gm%	kcal%
Protein	26	20	19.2	20
Carbohydrate	26	20	67.3	70
Fat	35	20	4.3	10
kcal/gm	**5.24**		**3.85**	
7% Saccharose				
	weight（g）	**calorie（kcal）**	**weight（g）**	**calorie（kcal）**
Casein	200	800	200	800
L-Cystine	3	12	3	12
Corn starch	0	0	506.2	2024.8
Maltodextrin	125	500	125	500
Saccharose	68.8	275.2	68.8	275.2
Cellulose	50	0	50	0
Soybean oil	25	225	25	225
Lard	245	2205	20	180
Complex mineral #210088	10	0	10	0
Calcium hydrophosphate	13	0	13	0
Calcium carbonate	5.5	0	5.5	0
Potassium citrate	16.5	0	16.5	0
Decavitamin #300050	10	40	10	40
Choline hydrotartrate	2	0	2	0
Blue pigment	0.05	0	0.01	0
Xanthein			0.04	0
Total	773.85	4057.2	1055.05	4057

Table S3 Antibodies of target proteins

Atibody	Cat. #	Company	Origin
ZO-1	AF5145	Affinity	Pottstown, PA, USA
Occludin	AF4605	Affinity	Pottstown, PA, USA
Claudin-1	DF6919	Affinity	Pottstown, PA, USA
TLR4	AF7017	Affinity	Pottstown, PA, USA
NF-kB p65	AF5006	Affinity	Pottstown, PA, USA
GAPDH	T004	Affinity	Pottstown, PA, USA

Table S4 Primer Sequences of Target Genes

Target gene	Forward primer	Reverse primer
ZO-1	AGGACACCAAAGCATGTGAG	GGCATTCCTGCTGGTTACA
Occludin	ACGGACCCTGACCACTATGA	TCAGCAGCAGCCATGTACTC
Claudin-1	GCCAACACCTTCTAGTGGGA	CAAGGAGCACCTTATCCCCG
GAPDH	AGGTCGGTGTGAACGGATTTG	TGTAGACCATGTAGTTGAGGTCA