

The synergistic action of metformin and *Glycyrrhiza uralensis* Fischer extract alleviates metabolic disorders in mice with diet-induced obesity

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Supplementary Material

Table S1. Diet composition for animal experiment I.

Ingredient(g)	ND (AIN-93G)	HFD (60 kcal% fat)	LGU (0.015%)	HGU (0.03%)
Casein	200	267	267	267
Corn starch	397.486	63.381	63.381	63.381
Sucrose	100	0	0	0
Dextrose	132	176	176	176
Cellulose	50	67	67	67
Soybean Oil	70	33	33	33
Lard	0	327	327	327
Mineral mixture	35	47	47	47
Vitamin mixture	10	13	13	13
TBHQ, antioxidant	0.014	0.019	0.019	0.019
L-cystine	3	4	4	4
Choline Bitartrate	2.5	3	3	3
GU	-	-	0.15	0.3
Total (g)	1000.00	1000.00	1000.15	1000.3
Calorie (kcal/g)	4000	5332.62	5332.62	5332.62

¹AIN-93 mineral mixture (g/kg): calcium carbonate anhydrous, 357; potassium phosphate monobasic, 196; potassium citrate tripotassium monohydrate, 70.78; sodium chloride, 74; potassium sulfate, 46.60; magnesium oxide, 24; ferric citrate, 6.06; zinc carbonate, 1.65; sodium meta-silicate·9H₂O, 1.45; manganous carbonate, 0.63; cupric carbonate, 0.30; chromium potassium sulfate·12H₂O, 0.275; boric acid, 0.0815; sodium fluoride, 0.635; nickel carbonate, 0.0318, lithium chloride, 0.0174, sodium selenite anhydrous, 0.01025; potassium iodate, 0.010; ammonium paramolybdate·4H₂O, 0.00795; ammonium vanadate 0.0066; powdered sucrose, 221.026 ²AIN-93G- Vitamin Mixture (g/kg): nicotinic acid, 3; Ca

pantothenate, 1.6; pyridoxine-HCl, 0.7; thiamin-HCl, 0.6; riboflavin, 0.6; folic acid, 0.2; biotin, 0.02; vitamin B-12 (cyanocobalamin), 2.5; vitamin E (all-rac- α -tocopheryl acetate), 15; vitamin A (all-trans-retinyl palmitate), 0.8; vitamin D-3 (cholecalciferol), 0.25; vitamin K-1 (phylloquinone), 0.075; powdered sucrose, 974.655. ND, Normal diet (AIN-93G 16 Kcal% fat); HFD, High fat diet (60 Kcal% fat); LGU, HFD + 0.015% *Glycyrrhiza uralensis* Fischer 0.015%; HGU, HFD + 0.003% *Glycyrrhiza uralensis* Fischer 0.015%;

Table S2. Diet composition for animal experiment II.

Ingredient(g)	ND	HFD	HFDM	GU	GUM
Casein	200	267	267	267	267
Corn starch	397.486	63.381	63.381	63.381	63.381
Sucrose	100	0	0	0	0
Dextrose	132	176	176	176	176
Cellulose	50	67	67	67	67
Soybean Oil	70	33	33	33	33
Lard	0	327	327	327	327
Mineral mixture¹	35	47	47	47	47
Vitamin mixture²	10	13	13	13	13
TBHQ, antioxidant	0.014	0.019	0.019	0.019	0.019
L-cystine	3	4	4	4	4
Choline Bitartrate	2.5	3	3	3	3
Metformin	-	-	0.5	-	0.5
GU	-	-	-	0.15	0.15
Total (g)	1000.00	1000.00	1000.50	1000.15	1000.65
Calorie (kcal/g)	4000	5332.62	5332.62	5332.62	5332.62

¹AIN-93 mineral mixture (g/kg): calcium carbonate anhydrous, 357; potassium phosphate monobasic, 196; potassium citrate tripotassium monohydrate, 70.78; sodium chloride, 74; potassium sulfate, 46.60; magnesium oxide, 24; ferric citrate, 6.06; zinc carbonate, 1.65; sodium meta-silicate·9H₂O, 1.45;

manganous carbonate, 0.63; cupric carbonate, 0.30; chromium potassium sulfate·12H₂O, 0.275; boric acid, 0.0815; sodium fluoride, 0.635; nickel carbonate, 0.0318, lithium chloride, 0.0174, sodium selenite anhydrous, 0.01025; potassium iodate, 0.010; ammonium paramolybdate·4H₂O, 0.00795; ammonium vanadate 0.0066; powdered sucrose, 221.026 ²AIN-93G- Vitamin Mixture (g/kg): nicotinic acid, 3; Ca pantothenate, 1.6; pyridoxine-HCl, 0.7; thiamin-HCl, 0.6; riboflavin, 0.6; folic acid, 0.2; biotin, 0.02; vitamin B-12 (cyanocobalamin), 2.5; vitamin E (all-rac- α -tocopheryl acetate), 15; vitamin A (all-trans-retinyl palmitate), 0.8; vitamin D-3 (cholecalciferol), 0.25; vitamin K-1 (phylloquinone), 0.075; powdered sucrose, 974.655. ND, Normal diet (AIN-93G 16 Kcal% fat); HFD, High fat diet (60 Kcal% fat); HFD_M, HFD + 50mg/kg Metformin; GU, HFD + 0.015% Glycyrrhiza uralensis Fischer 0.015%; GUM, HFD + 0.015% Glycyrrhiza uralensis Fischer +50mg/kg Metformin.