Maternal food restriction during pregnancy leads to intrauterine growth retardation and rapid postnatal catch-up growth. The aim of this study was to examine glucose preference in rat offspring exposed to food restriction in utero. Control pregnant Wistar rats ($n=9$) had free access to food. Food restricted rats ($FR, n=11$) received 50% of the food consumed by control rats from day 1 of pregnancy until birth. Glucose preference (5% glucose or tap water) was tested in male offspring weekly from 6–12 weeks of age. FR offspring were significantly smaller at birth, but they were heavier between 8 and 10 weeks of age ($C 207\pm11$ vs $MFR 212\pm9$ g, $P<0.05$). FR offspring consumed $343\pm35$ g more food than control animals at all stages ($P<0.05$). Initially glucose preference and blood glucose level were comparable to control, however, FR glucose preference ($C 17\pm5.4$ vs $FR 21\pm4.7$ ml/day) and blood glucose concentration ($C 112\pm9.6$ vs $FR 117\pm11.3$ mg%) increased significantly ($P<0.05$) from week 10 onwards. These data suggest that maternal food restriction increases food intake, sugar appetite and blood glucose concentration in male offspring. Together this may increase the risk of developing diabetes in later life.