

Additional file 1

Supplementary Figures

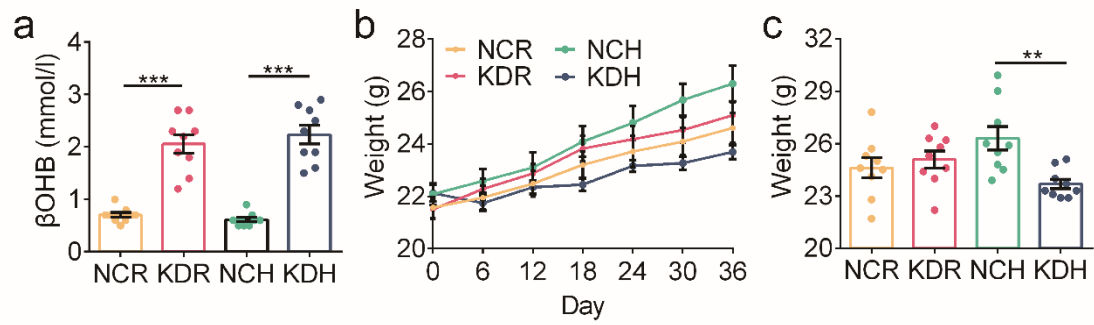


Figure S1 The β -hydroxybutyrate and weight of mice in *Trial 1*. **a.** Blood ketone (β -hydroxybutyrate) levels. **b.** Body weight curves. **c.** The body weight of each group after 5 weeks of dietary intervention. Data are presented as the mean $\pm$ SEM and analyzed using one-way ANOVA, followed by a Tukey post hoc test. ** $P < 0.01$, *** $P < 0.001$. $n = 8-9$ for both groups for all analyses.

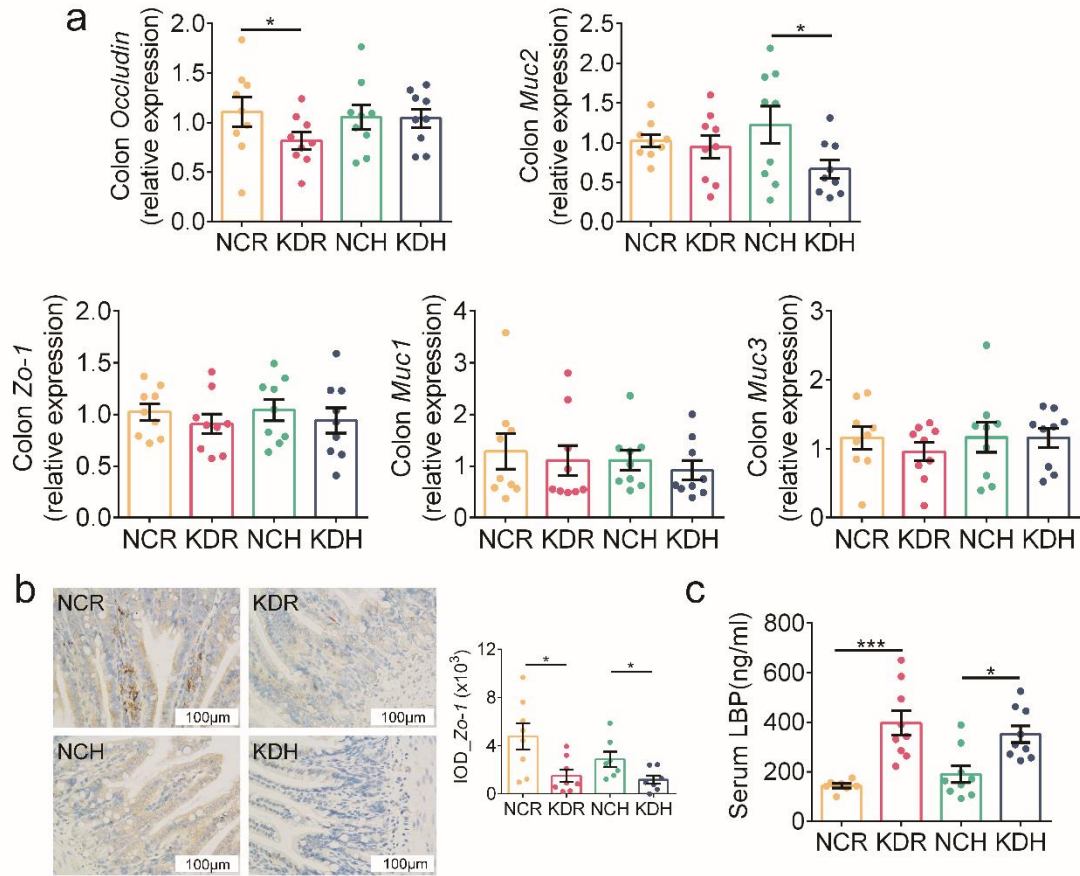


Figure S2 Two kinds of KD impaired intestinal barrier function in mice. **a** Relative expression of *Occludin*, *Muc2*, *Zo-1*, *Muc1* and *Muc3* genes in the colon. Differences are analyzed using T test. **b** Representative immunohistochemistry-stained (brown) sections for ZO-1 of ileum (Scale bar = 100 μ m) and calculated average integrated optical density (IOD). **c** Serum level of LBP. Data are presented as the mean $\pm$ SEM and analyzed using one-way ANOVA, followed by a Tukey post hoc test. * $P < 0.05$, *** $P < 0.001$. $n = 8-9$ for both groups for all analyses.

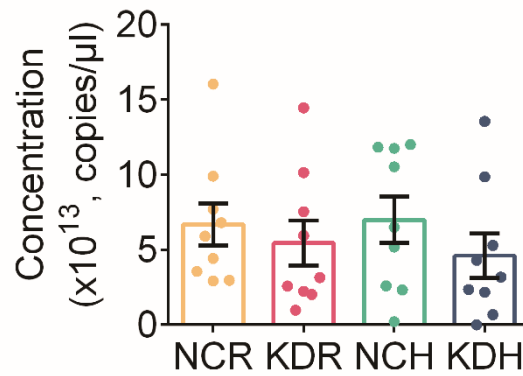


Figure S3 Total fecal bacteria concentrations of each group after 5 weeks of dietary intervention. Data were analyzed using one-way ANOVA, followed by a Tukey post hoc test. $n = 9$ for both groups for all analyses.

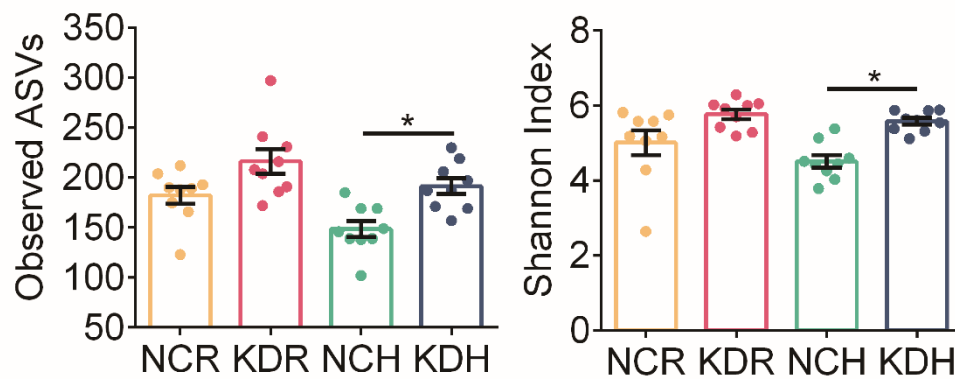


Figure S4 Observed ASVs and Shannon diversity index after 5 weeks of dietary intervention. Data are presented as the mean $\pm$ SEM and analyzed using Kruskal-Wallis test. $*P < 0.05$. $n = 9$ for both groups for all analyses.

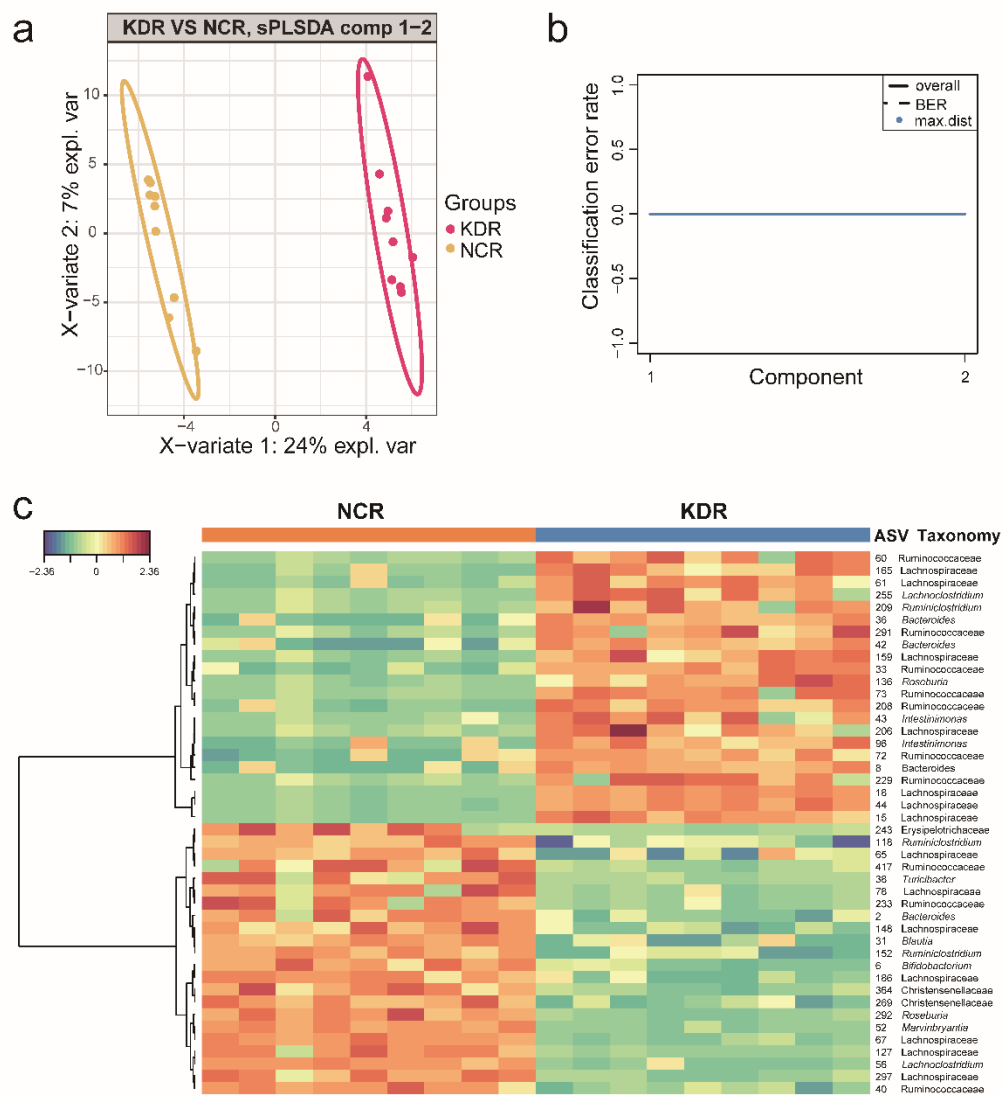


Figure S5 44 ASVs differentiating gut microbiota structure between NCR and KDR mice in *Trial 1*. **a**. The sPLS-DA plot of gut microbiota. **b**. The classification error rate of one component across the leave-one-out cross validation for maximum distance. **c**. The heatmap of selected 44 ASVs between NCR and KDR mice (5th week).

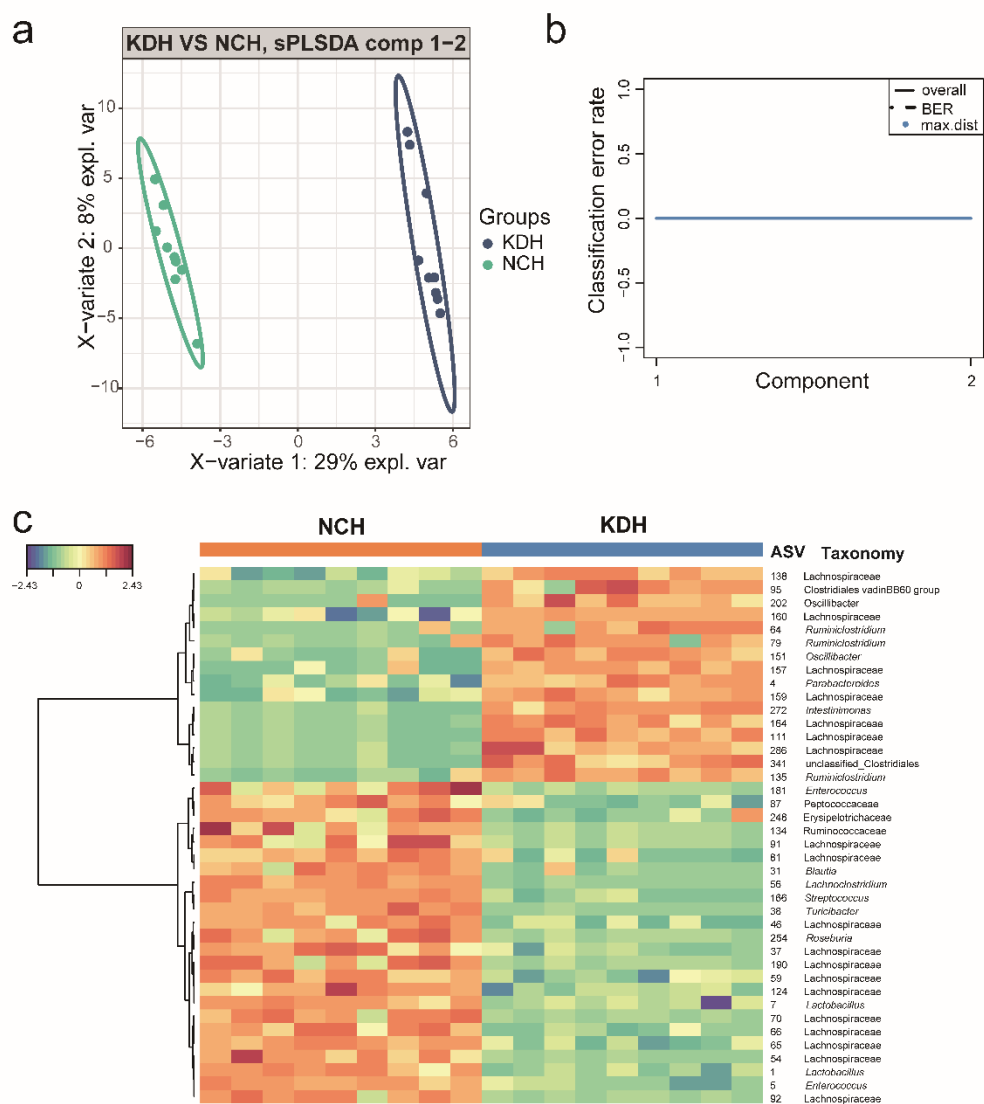


Figure S6 40 ASVs differentiating gut microbiota structure between NCH and KDH mice in *Trial 1*. **a.** The sPLS-DA plot of gut microbiota. **b.** The classification error rate of one component across the leave-one-out cross validation for maximum distance. **c.** The heatmap of selected 40 ASVs between NCH and KDH mice (5th week).

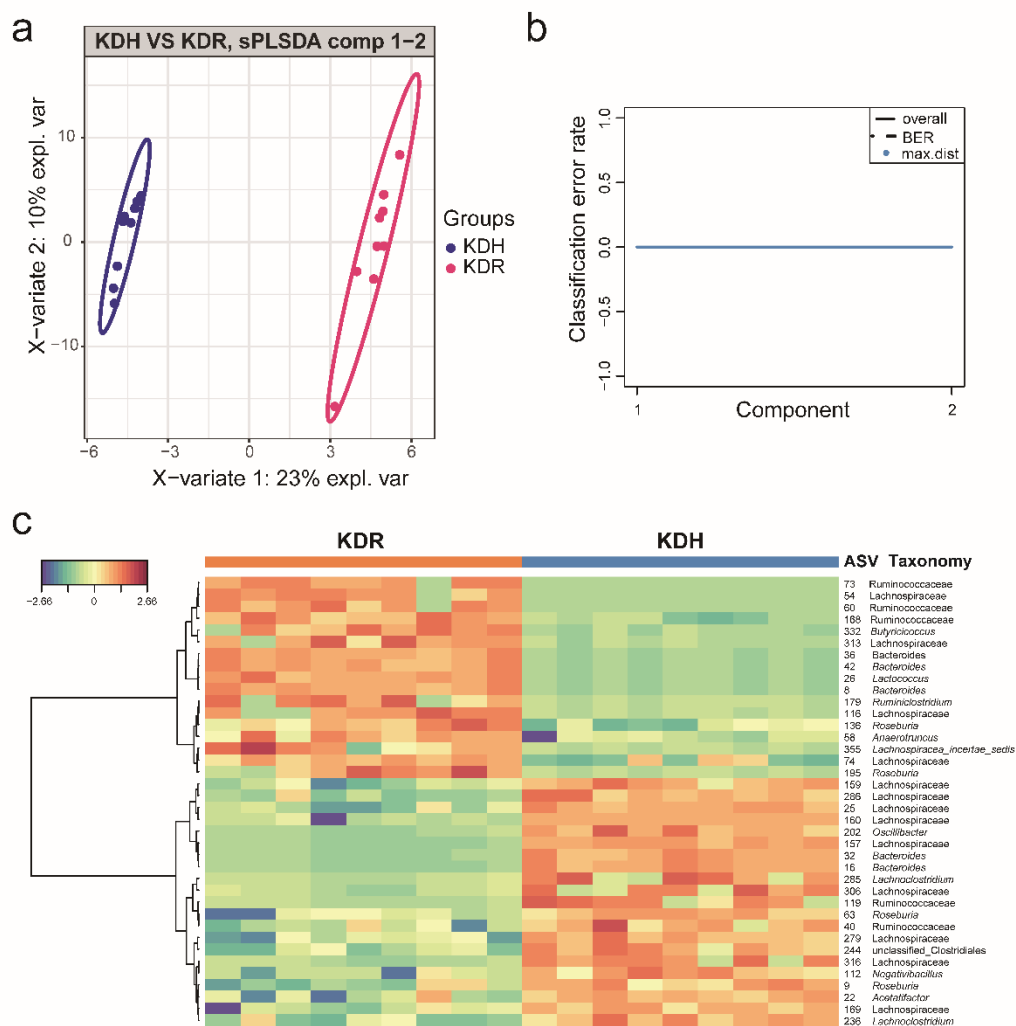


Figure S7 38 ASVs differentiating gut microbiota structure between KDR and KDH mice in *Trial 1*. **a.** The sPLS-DA plot of gut microbiota. **b.** The classification error rate of one component across the leave-one-out cross validation for maximum distance. **c.** The heatmap of selected 38 ASVs between KDR and KDH mice (5th week).

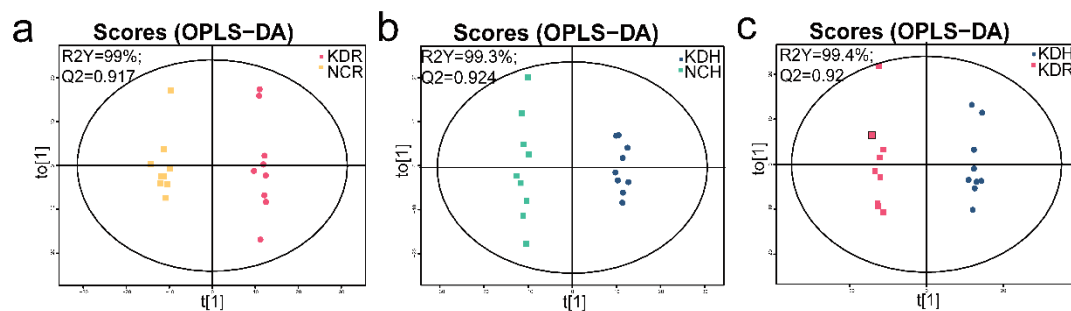


Figure S8 The OPLS-DA score plots of metabolic profiles in cecum content of mice in *Trial 1*. **a.** NCR vs. KDR. **b.** NCH vs. KDH. **c.** KDR vs. KDH.

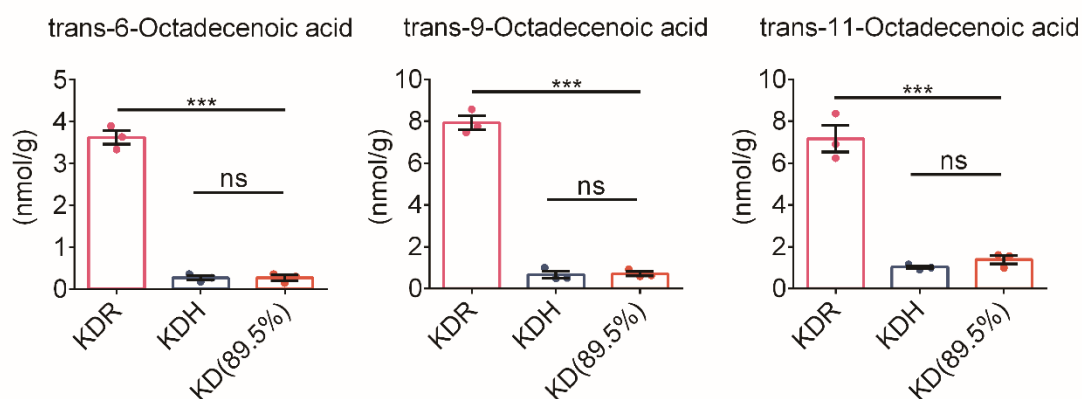


Figure S9 The concentrations of trans-6, 9, 11-octadecenoic acid in three different ketogenic diets. KDR, KDH and KD(89.5%); 3 repeats. Data are presented as the mean $\pm$ SEM and analyzed using one-way ANOVA, followed by a Tukey post hoc test. *** $P < 0.001$.

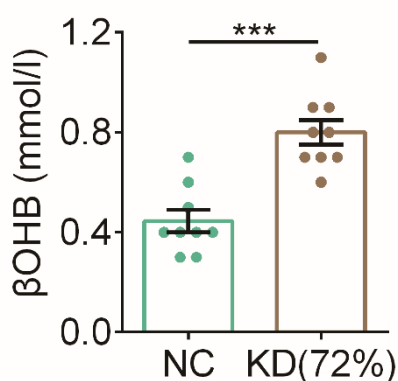


Figure S10 The β -hydroxybutyrate levels of mice in *Trial 3*. Data are presented as the mean $\pm$ SEM and analyzed using T test. *** $P < 0.001$. $n = 9$ for both groups for all analyses.

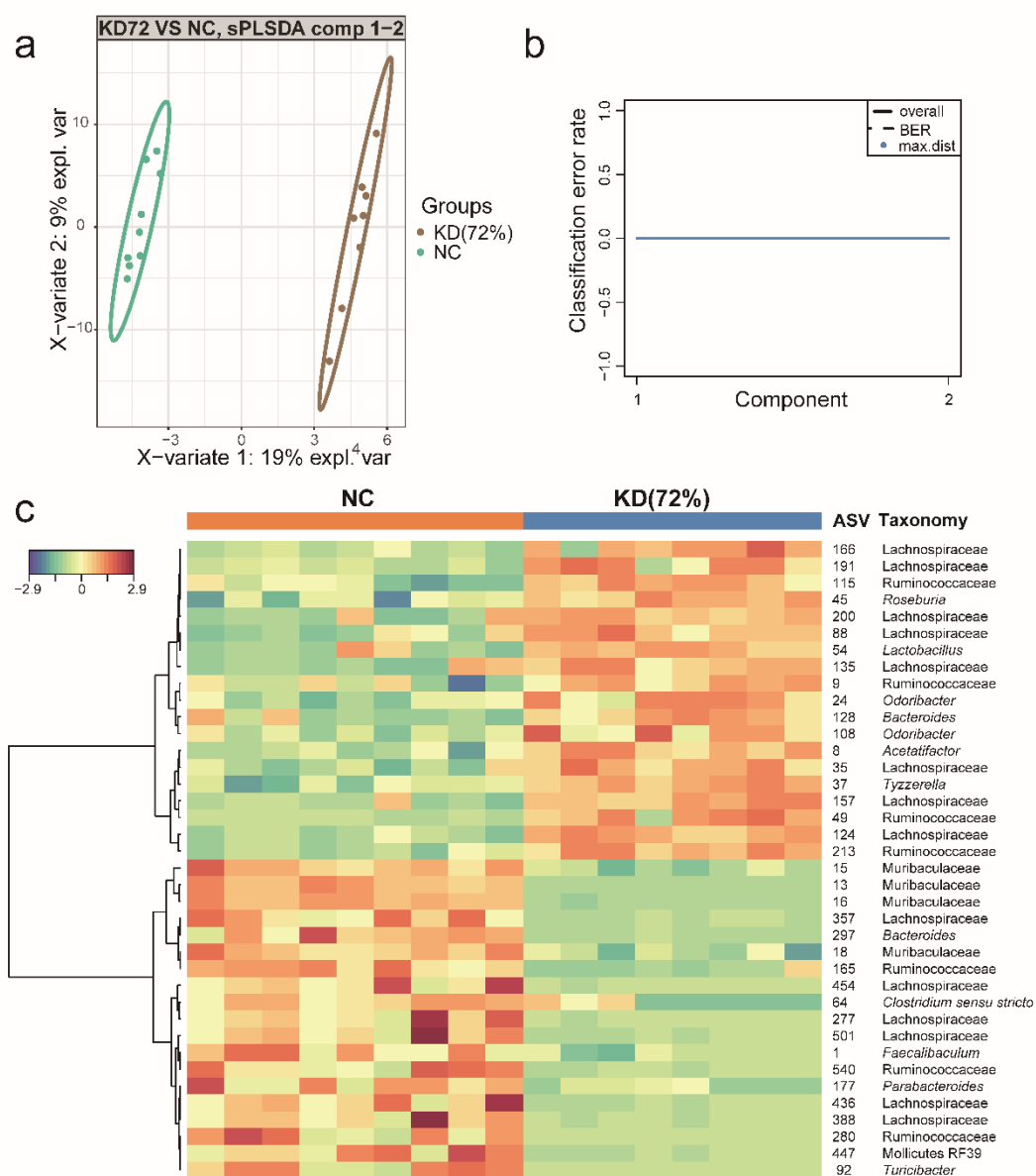


Figure S11 38 ASVs differentiating gut microbiota structure between NC and KD(72%) mice in *Trial 3*.

a. The sPLS-DA plot of gut microbiota. **b.** The classification error rate of one component across the leave-one-out cross validation for maximum distance. **c.** The heatmap of selected 38 ASVs between NC and KD(72%) mice (5th week).