

1 **Supplementary tables**

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3 **Intestinal inflammation induced by dextran sodium sulphate causes liver inflammation and lipid**
4 **metabolism dysfunction in laying hens**

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20 **Supplementary Table S1** PCR primers used for mRNA expression analysis.

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Target genes	Forward Primer	Revers Primer	Product size	Accession no.
<i>IL-1β</i>	GTGAGGCTCAACATTGCGCTGTA	TGTCCAGGCGGTAGAAGATGAAG	214	NM_204524.1
<i>IL-6</i>	AGAAATCCCTCCTCGCCAAT	AAATAGCGAACGCCCCTCA	121	NM_204628.1
<i>CXCL2</i>	CTGTCCTGGCCCTCCTCTGGTT	TGGCGTCAGCTTCACATCTTG	146	NM_205498.1
<i>IL-10</i>	GCTGAGGGTGAAGTTTGAAGAA	GAAGCGCAGCATCTCTGACA	142	NM_001004414.2
<i>TGFβ-2</i>	AGGAATGTGCAAGATAATT	ATTTTGGGTGTTTTGCCAA	269	NM_001031045.3
<i>TGFβ-3</i>	CAGATCCTGGCGCTCTACA	GAGGCCTGGATCATGTCA	141	NM_205454.1
<i>TGFβ-4</i>	ATGAGTATTGGGCCAAAG	ACGTTGAACACGAAGAAG	109	NM_001318456.1
<i>ACC</i>	CTCAGAAATGCCTTTGTC	CATCTTCCTCGTGTCTCC	145	NM_205505.1
<i>FAS</i>	TGAAGGCAATGGGAAACAG	GACATAACAGGATGAGGTTGATT	112	NM_205155.1
<i>SCD-1</i>	ATCTGCACCTCCTTTGGTCG	GGGATGCCTCACTGCCATTA	187	DQ645535.1
<i>LDLr</i>	GGAGCAGTCACAGCATCAGCT	CTGTGTCACACTCCGCTGTCTC	109	NM_204452.1
<i>SREBP-1</i>	CTACCGCTCATCCATCAACG	CTGCTTCAGCTTCTGGTTGC	145	NM_204126.2
<i>SREBP-2</i>	TCCTTGATGATGCAAAGGTTAAGG	AGGGATGTCAAAGGGTTGAAGG	105	XM_015289037.2
<i>ApoB</i>	CTGCAAATGTGGGCTGTTT	CTGGTTGAGCCATCCAGCTT	106	NM_001044633.1
<i>ApoVLDL-II</i>	AGGGCTGAACTGGTACCAACAAAC	GGATGACCAGCCAGTCACGA	140	NM_205483.2
<i>VTG-II</i>	CAACATATCTTCCGCTTGTAACATTG	TTCACAACAAAGATTTCTCCAGTAGC	147	NM_001031276
<i>ERα</i>	CTTCATCCATCACCACAG	TAGACATCCTCTCACGAAT	143	NM_205183.1
<i>RPS17</i>	AAGCTGCAGGAGGAGGAGAGG	GGTTGGA CAGGCTGCCGAAGT	136	NM_204217.1
<i>GLUT-2</i>	CACACTATGGGCGCATGCT	ATTGTCCTGGAGGTGTTGGTG	68	NM_207178.1
<i>GLUT-5</i>	TTGCTGGCTTTGGGTTGTG	GGAGGTTGAGGGCCAAAGTC	60	XM_025142667.1
<i>SGLT-1</i>	GCCGTGGCCAGGGCTTA	CAATAACCTGATCTGTGCCACAGTA	71	NM_001293240.1

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24 F, forward; R, reverse, *PCR products were sequenced for verification.

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Supplementary Table S2 Effects of paired feeding on the egg production, egg weight and egg shell weight.

	group	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Number of	Con	4/4	3/4	3/4	3/4	3/4	3/4
egg laying	DSS	4/4	4/4	4/4	4/4	4/4	3/4
Egg weight	Con	100.0	97.4 \pm 2.4	94.3 \pm 1.9	101.6 \pm 3.2	104.5 \pm 1.6 ^a	97.6 \pm 1.8 ^a
(%)	DSS	100.0	100.2 \pm 0.8	100.5 \pm 1.4	98.1 \pm 1.8	96.3 \pm 1.4 ^b	90.2 \pm 1.5 ^b
Egg-shell	Con	100.0	92.4 \pm 6.5	81.0 \pm 5.0	85.3 \pm 8.7	105.0 \pm 4.6 ^a	98.4 \pm 5.9 ^a
weight (%)	DSS	100.0	97.7 \pm 3.2	88.6 \pm 1.2	77.6 \pm 1.5	76.2 \pm 1.5 ^b	71.4 \pm 0.2 ^b

Number of egg laying means produced egg number/total hen number. Values are mean \pm SEM of the ratio of egg weight and egg-shell weight against day 0 (%).

Lower case letters (a, b) indicate significant differences between the control and PF groups (P < 0.05).

Supplementary Figures

Intestinal inflammation induced by dextran sodium sulphate causes liver inflammation and lipid metabolism dysfunction in laying hens

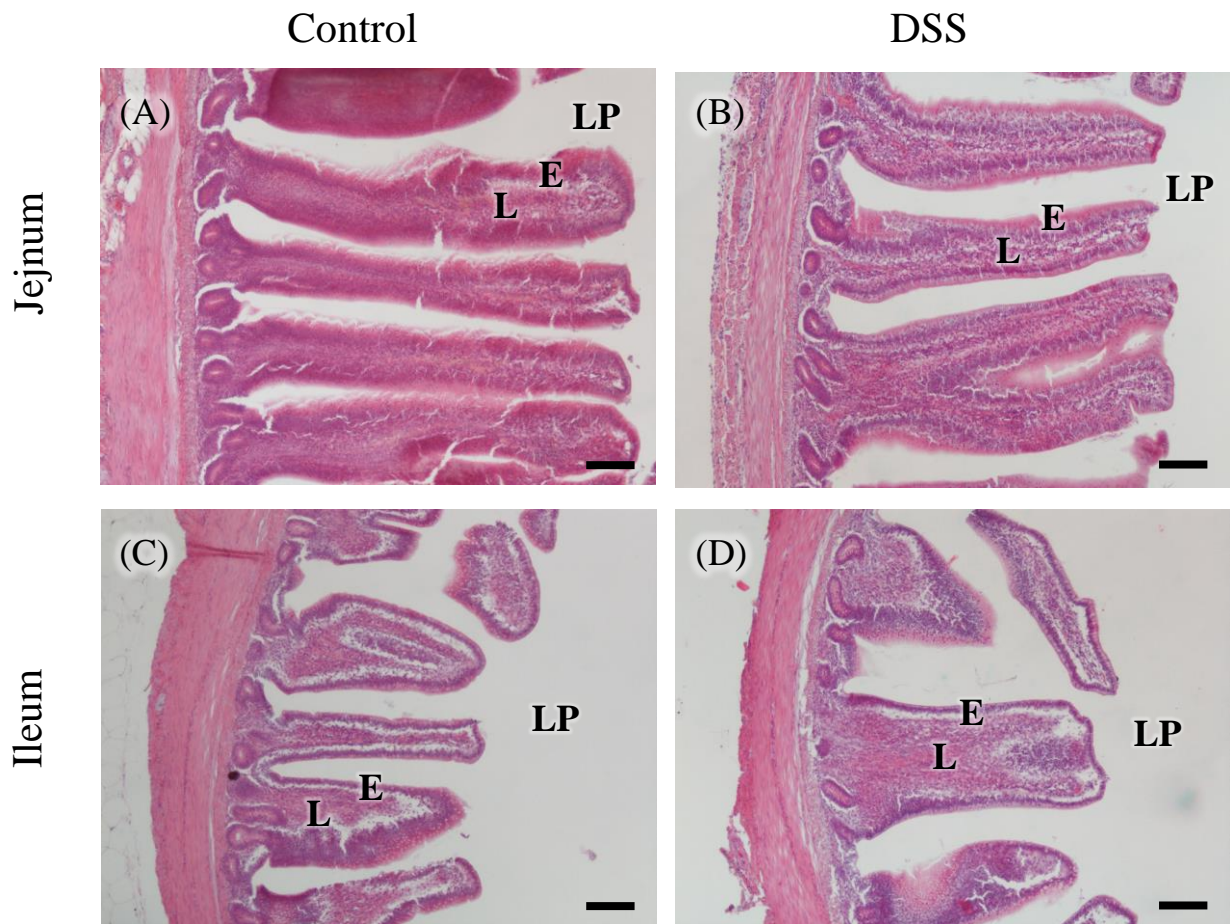
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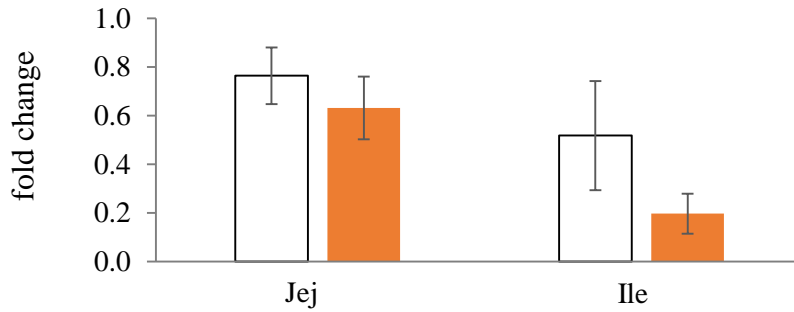
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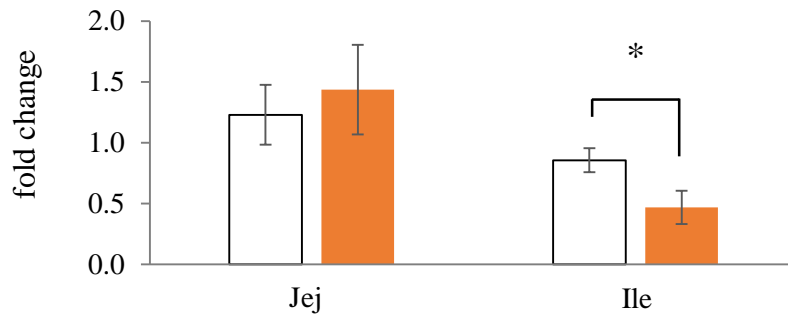


Supplementary Figure S1 Micrographs showing the histology of the jejunum and ileum of hens oral administered DSS (DSS group) or water (control group). HE-stained tissue from the (A) jejunum of the control group, (B) jejunum of the DSS group, (C) ileum of the control group, and (D) ileum of the DSS group. The lamina propria is covered with simple columnar epithelium. E = mucosal epithelium, L = lumen, LP = lamina propria. Scale bars = 100 μ m.

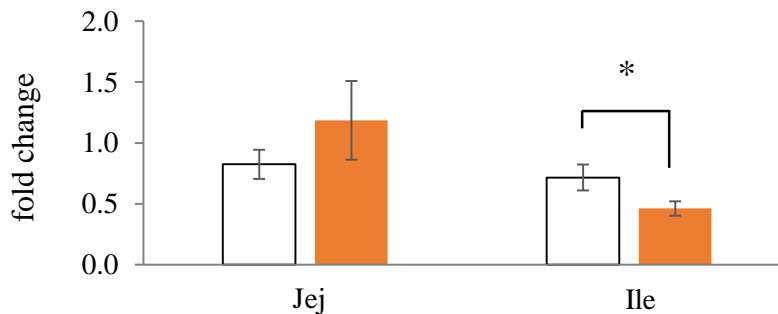
(A) *GLUT2*



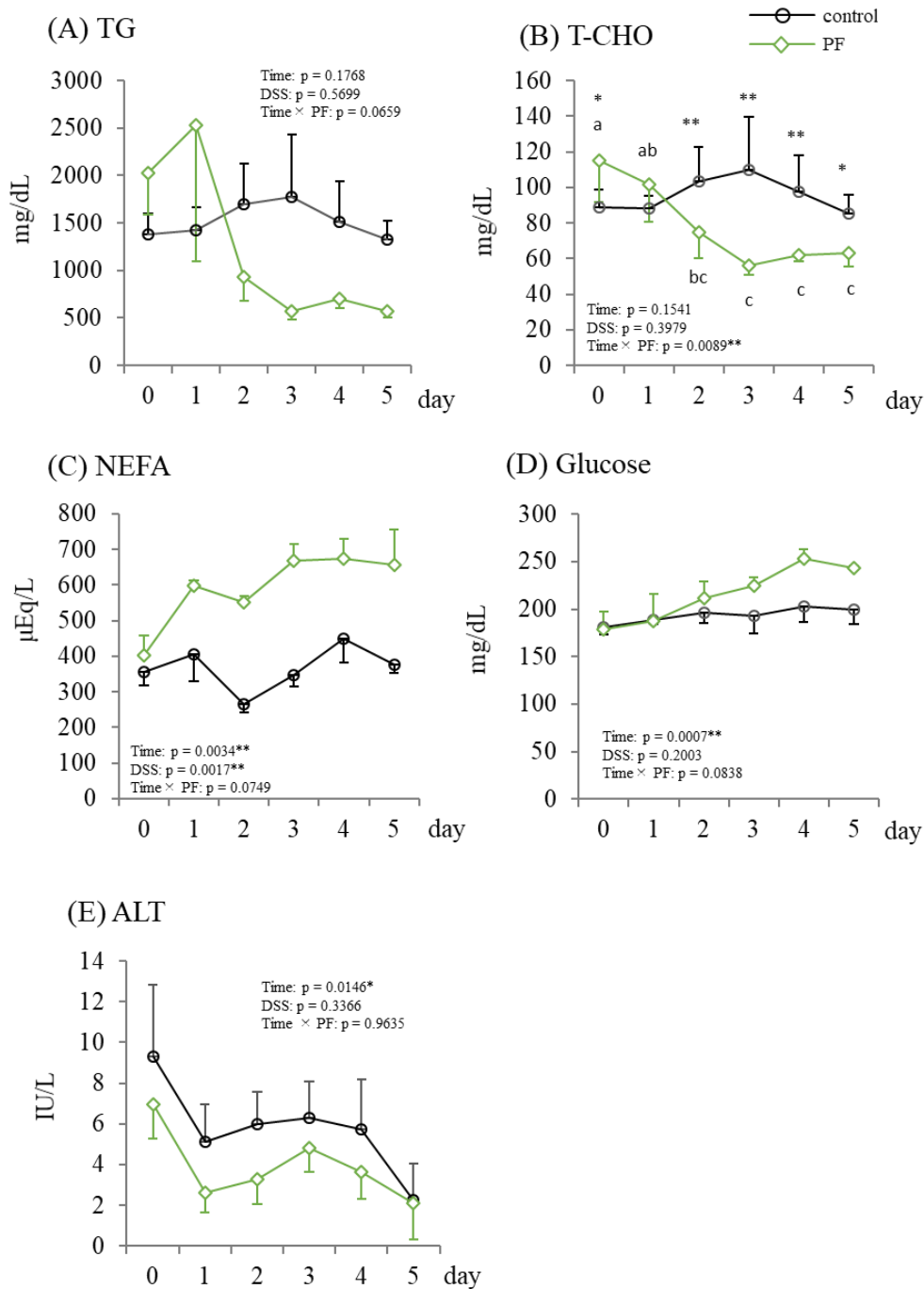
(B) *GLUT5*



(C) *SGLT1*

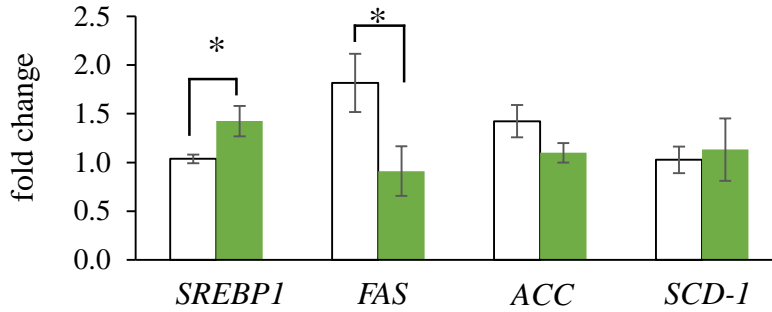


Supplementary Figure S2 Effects of oral administration of DSS on the mRNA expression of the glucose transporters (A) *GLUT2*, (B) *GLUT5*, and (C) *SGLT1* in the jejunum and ileum. Open bars are the control group, and orange filled bars are the DSS group. Values are mean \pm SEM (n = 8) of fold change in the target gene expression from a standard sample of each segment in the control group. Target gene expression was normalized to the house-keeping gene RPS17. An asterisk (*) indicates a significant difference between the control and DSS groups ($P < 0.05$).

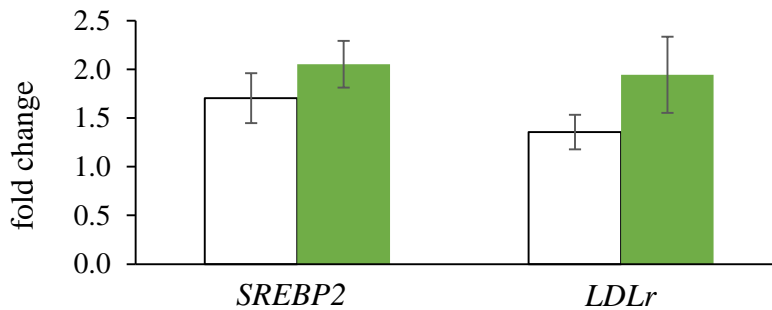


Supplementary Figure S3 Changes in the blood serum parameters TG (A), T-CHO (B), NEFA (C), glucose (D), and ALT (E) of hens during the paired feeding experiment in the restricted feed (PF) and ad libitum feed (control) groups. Open circle plots are the control group, and green open rhombus plots are the PF group. Values are the mean \pm SEM ($n = 4$). Significant differences between the control and PF groups at the same time point are indicated with asterisks (*, ** indicate $P < 0.05$ and $P < 0.01$, respectively). Significant differences at different time points are shown as different letters (a–c; $P < 0.05$).

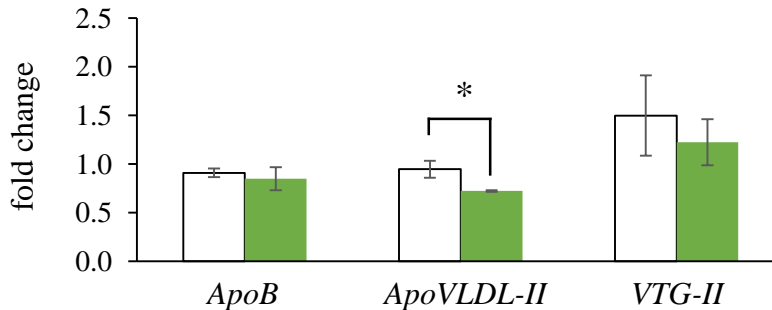
(A) Lipid synthesis-related genes



(B) Lipoprotein uptake-related genes



(C) Yolk precursor synthesis-related gene



Supplementary Figure S4 Effects of paired feeding (PF) on the mRNA expression of lipid synthesis-related genes (A; *SREPB-1*, *FAS*, *ACC*, and *SCD-1*), lipoprotein uptake-related genes (B; *SREPB-2* and *LDLr*), and yolk precursor-related genes (C; *ApoB*, *ApoVLDL-II*, and *VTG-II*) in the liver of hens. Open bars are the control group, and green filled bars are the PF group. Values are mean \pm SEM (n = 8) of fold change in the target gene expression from a standard sample of the control group. Target gene expression was normalized to the house-keeping gene *RPS17*. An asterisk (*) indicates a significant difference between the *ad libitum* feed (control) and PF groups (P < 0.05).