

Table S1. Treatment comparison between metabolites related to hepatic glucose metabolism. Metabolites of glucose metabolism in the liver of Fischer 344 rats fed a STD diet and exposed to three different photoperiods for 9 weeks, supplemented with vehicle or GSPE for the last 4 weeks. The statistically significant p-values ($p < 0.05$) are highlighted in bold.

| Metabolites | L12 | | | | L18 | | | | L6 | | | |
|----------------------|--------------|---------------|--------------|-----|---------------|---------------|--------------|-----|---------------|---------------|---------|-----|
| | STD-VH | STD-GSPE | p-value | FC | STD-VH | STD-GSPE | p-value | FC | STD-VH | STD-GSPE | p-value | FC |
| Pyruvic acid | 0.62 ± 0.05 | 0.55 ± 0.07 | 0.424 | 0.9 | 0.87 ± 0.19 | 0.56 ± 0.05 | 0.144 | 0.6 | 0.68 ± 0.09 | 0.62 ± 0.07 | 0.661 | 0.9 |
| Lactic acid | 20.07 ± 0.74 | 20.01 ± 0.89 | 0.957 | 1 | 20.66 ± 1.78 | 20.34 ± 0.7 | 0.871 | 1 | 21.52 ± 1.21 | 19.21 ± 0.86 | 0.141 | 0.9 |
| Glycerol | 0.08 ± 0.01 | 0.07 ± 0.01 | 0.407 | 0.8 | 0.07 ± 0.01 | 0.06 ± 0 | 0.218 | 0.8 | 0.08 ± 0.01 | 0.07 ± 0.01 | 0.568 | 0.9 |
| Glycerol-1-phosphate | 1.6 ± 0.09 | 1.51 ± 0.08 | 0.421 | 0.9 | 1.53 ± 0.09 | 1.62 ± 0.09 | 0.492 | 1.1 | 1.69 ± 0.12 | 1.56 ± 0.1 | 0.404 | 0.9 |
| d-Glucose | 150.4 ± 2.92 | 150.72 ± 2.33 | 0.933 | 1 | 156.07 ± 2.94 | 147.73 ± 1.19 | 0.027 | 0.9 | 154.73 ± 4.04 | 151.43 ± 2.78 | 0.511 | 1 |
| d-Ribose | 0.02 ± 0 | 0.01 ± 0 | 0.582 | 0.9 | 0.05 ± 0.02 | 0.01 ± 0 | 0.027 | 0.2 | 0.02 ± 0 | 0.01 ± 0 | 0.187 | 0.7 |
| Ribose-5-phosphate | 0.62 ± 0.05 | 0.55 ± 0.07 | 0.424 | 0.9 | 0.87 ± 0.19 | 0.56 ± 0.05 | 0.144 | 0.6 | 0.68 ± 0.09 | 0.62 ± 0.07 | 0.661 | 0.9 |
| Fructose-6-phosphate | 0.03 ± 0 | 0.02 ± 0 | 0.018 | 0.6 | 0.03 ± 0.01 | 0.04 ± 0.01 | 0.37 | 1.3 | 0.03 ± 0 | 0.03 ± 0 | 0.418 | 1.2 |
| Glucose-6-phosphate | 0.08 ± 0.01 | 0.05 ± 0.01 | 0.033 | 0.6 | 0.07 ± 0.01 | 0.09 ± 0.01 | 0.318 | 1.3 | 0.06 ± 0.01 | 0.08 ± 0.01 | 0.44 | 1.2 |

Table S2. Photoperiod comparison between metabolites related to hepatic glucose metabolism. Metabolites of glucose metabolism in the liver of Fischer 344 rats fed a STD diet and exposed to three different photoperiods for 9 weeks, supplemented with vehicle or GSPE for the last 4 weeks. The statistically significant p-values ($p < 0.05$) are highlighted in bold.

| Metabolites | L12-VH vs. L18-VH | | L12- VH vs. L6-VH | | L18-VH vs. L6-VH | | L12-GSPE vs. L18-GSPE | | L12-GSPE vs. L6-GSPE | | L18-GSPE vs. L6-GSPE | |
|----------------------|-------------------|-----|-------------------|-----|------------------|-----|-----------------------|-----|----------------------|-----|----------------------|-----|
| | p-value | FC | p-value | FC | p-value | FC | p-value | FC | p-value | FC | p-value | FC |
| Pyruvic acid | 0.241 | 1.4 | 0.639 | 1.1 | 0.381 | 0.8 | 0.931 | 1 | 0.472 | 1.1 | 0.47 | 1.1 |
| Lactic acid | 0.766 | 1 | 0.323 | 1.1 | 0.692 | 1 | 0.775 | 1 | 0.527 | 1 | 0.325 | 0.9 |
| Glycerol | 0.564 | 0.9 | 0.876 | 1 | 0.652 | 1.1 | 0.469 | 0.9 | 0.899 | 1 | 0.417 | 1.2 |
| Glycerol-1-phosphate | 0.576 | 1 | 0.549 | 1.1 | 0.298 | 1.1 | 0.356 | 1.1 | 0.664 | 1 | 0.655 | 1 |
| d-Glucose | 0.193 | 1 | 0.399 | 1 | 0.793 | 1 | 0.295 | 1 | 0.848 | 1 | 0.267 | 1 |
| d-Ribose | 0.043 | 3.1 | 0.308 | 1.4 | 0.102 | 0.4 | 0.159 | 0.7 | 0.947 | 1 | 0.12 | 1.5 |
| Ribose-5-phosphate | 0.241 | 1.4 | 0.639 | 1.1 | 0.381 | 0.8 | 0.931 | 1 | 0.472 | 1.1 | 0.47 | 1.1 |
| Fructose-6-phosphate | 0.411 | 0.8 | 0.266 | 0.8 | 0.87 | 1 | 0.038 | 1.7 | 0.055 | 1.5 | 0.661 | 0.9 |
| Glucose-6-phosphate | 0.432 | 0.8 | 0.269 | 0.8 | 0.791 | 0.9 | 0.043 | 1.7 | 0.095 | 1.5 | 0.506 | 0.9 |

Table S3: Summary of the main metabolic changes due to the GSPE treatment in each photoperiod compared to its respective VH control.

| pathway/treatment | GSPE L12 | GSPE L18 | GSPE L6 |
|-------------------|----------|-----------|-----------|
| GLUCONEOGENESIS | equal | equal | increased |
| GLUCOLISIS | equal | increased | equal |
| LIPOLISIS | equal | equal | equal |
| LIPOGENESIS | equal | decreased | equal |

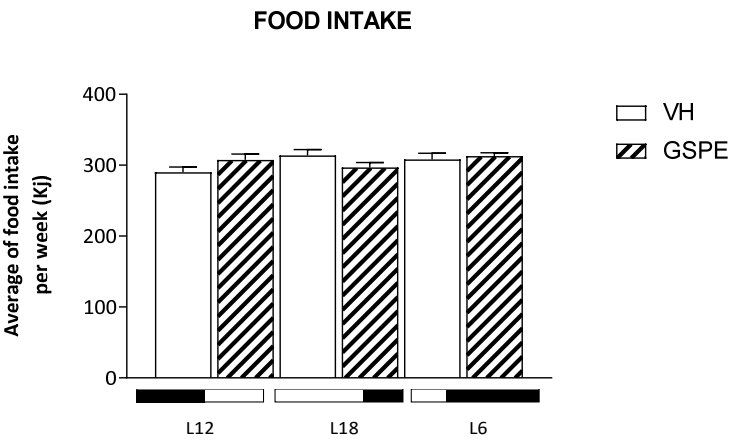


Figure S1: Average of weekly food intake (kJ) of different photoperiods