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| **SUPPLEMENTARY DATA****Supplementary Table. Maternal and Fetal Arterial Blood Gas and Acid Base Balance Following Chronic Interventions** |
| **Maternal** | **pH** | **PaCO2 (mmHg)** | **Lactate (mmol/L)** | **PaO2 (mmHg)** | **Hematocrit (%)** | **SaO2 (%)** | **O2 Content (mmol/L)** |
| Control | 7.441±0.011 | 35.1±1.3 | 0.67±0.05 | 84.8±0.7 | 27.9±1.1 | 94.2±0.8 | 5.26±0.23 |
| Constant Hyperglycemia | 7.470±0.008\* | 36.7±0.5 | 0.68±0.13 | 87.6±2.1 | 25.5±2.1 | 95.9±0.6 | 4.82±0.41 |
| Pulsatile Hyperglycemia | 7.473±0.012\* | 33.6±0.7 | 1.01±0.31 | 89.1±2.0 | 31.5±1.2 | 97.2±1.7 | 5.50±0.7 |
| **Fetal** |   |   |   |   |   |   |   |
| *Basal Period* |   |   |   |   |   |   |   |
| Control | 7.348±0.012 | 50.6±0.5 | 1.81±0.21 | 18.7±0.9 | 31.8±1.0 | 50.5±3.9 | 3.14±0.23 |
| Constant Hyperglycemia | 7.329±0.010 | 54.7±0.6\* | 3.84±0.92\* | 17.0±1.3 | 35.5±2.5 | 42.8±5.6 | 2.85±0.33 |
| Pulsatile Hyperglycemia | 7.376±0.007# | 48.5±0.9# | 1.85±0.19# | 20.7±1.4 | 32.3±1.4 | 48.9±2.6 | 2.92±0.14 |
| *Hyperglycemic Period* |   |   |   |   |   |   |   |
| Control | 7.322±0.012◊ | 52.4±0.7◊ | 2.25±0.24◊ | 18.5±0.9 | 31.4±0.9◊ | 47.0±3.6◊ | 2.86±0.20◊ |
| Constant Hyperglycemia | 7.324±0.008 | 55.8±1.2◊\* | 3.92±0.76\* | 16.7±1.3 | 34.3±2.5◊ | 41.3±5.5 | 2.64±0.29◊ |
| Pulsatile Hyperglycemia | 7.350±0.007◊ | 49.4±0.9# | 2.33±0.21◊ | 20.1±1.2 | 31.7±1.3◊ | 46.9±2.8 | 2.80±0.18 |
| Fetal Basal and Hyperglycemic periods refer to measurements made immediately before and during the fetal square-wave hyperglycemic clamp, respectively. \* indicates a significant difference from Control, # indicates a significant difference from chronic constant hyperglycemic group, ◊ indicates a significant difference between basal and hyperglycemic periods within a treatment group, (P<0.05). |
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**Supplementary Figure. Fetal glucose stimulated insulin secretion.** A square-wave fetal hyperglycemic clamp beginning at time zero was used to test insulin secretion in control (A), CHG (B), and PHG (C) fetuses (glucose concentrations are plotted in the upper panels and insulin concentrations in the lower panels) on day seven. \* indicates a significant difference from baseline concentrations (-25, -15, -5 minutes), P=0.029.

