The fetal stress responses in sows euthanized by electrical current during their second and last trimester of pregnancy (G1 and G2) were evaluated. Three methods of euthanasia of pregnant sows generally applicable to cases of epizootic or emergency slaughter were investigated: 1. conventional application of electrical current to the head and heart (HH); 2. application of electrical current to the head, heart and the uterus (HHU); 3. application of electrical current to the head, heart and from the upper body to the vagina (HHV). Fetuses were delivered by cesarean section at intervals of 3 to 4 minutes and remained attached to the sow by the umbilical cord. Fetal vitality, reflexes, heart rate, blood pressure, rectal body temperature, intracardial arteriovenous pCO2, pH and lactic acid were monitored for a period of 30 minutes. No method was found to kill the fetal pigs immediately. In fetuses at G1 there were no significant differences between the HH and HHU and HHV methods. Fetuses at G2 showed a significantly faster decrease in heart rate and blood pressure as well as a shorter period of time for the absence of fetal body movements and reflexes for the HHT method, compared to the other methods. Since it is not yet known to what extent the fetal pig experiences pain and suffering, the prolonged process of dying for the in utero fetus due to hypoxia which includes struggling and gasps is inconsistent with criteria for humane euthanasia and animal welfare.