Objective
Quantify extracorporeal CO₂ removal with a pumpless extracorporeal gas exchange device and its effects on the reduction of ventilatory volumes and airway pressures.

Study Design
Prospective experimental study.

Study Population
5 adult female sheep.

Methods
Cotton smoke inhalation injury (LD 50).
Measurement of ABG, CO₂ removal performance, mechanical ventilation settings.

Results
Maximum CO₂ removal performance amounted to 102 ml/min (96% of total CO₂ production) allowing to reduce minute ventilation from 10.5 to 0.5 l/min and peak inspiratory pressures from 40.8 to 19.7 mmHg, extracorporeal blood flow ranged from 1154 to 1277 ml/min. PaO₂ was maintained > 13.3 kPa at maximally reduced ventilator support. MAP and cardiac output did not change significantly.