

*Instrumenting a Ventilated Barn  
for Air Quality*

T. M. Brown-Brandl

# *Heat and Moisture Production of Modern Swine*

ASHRAE Grant

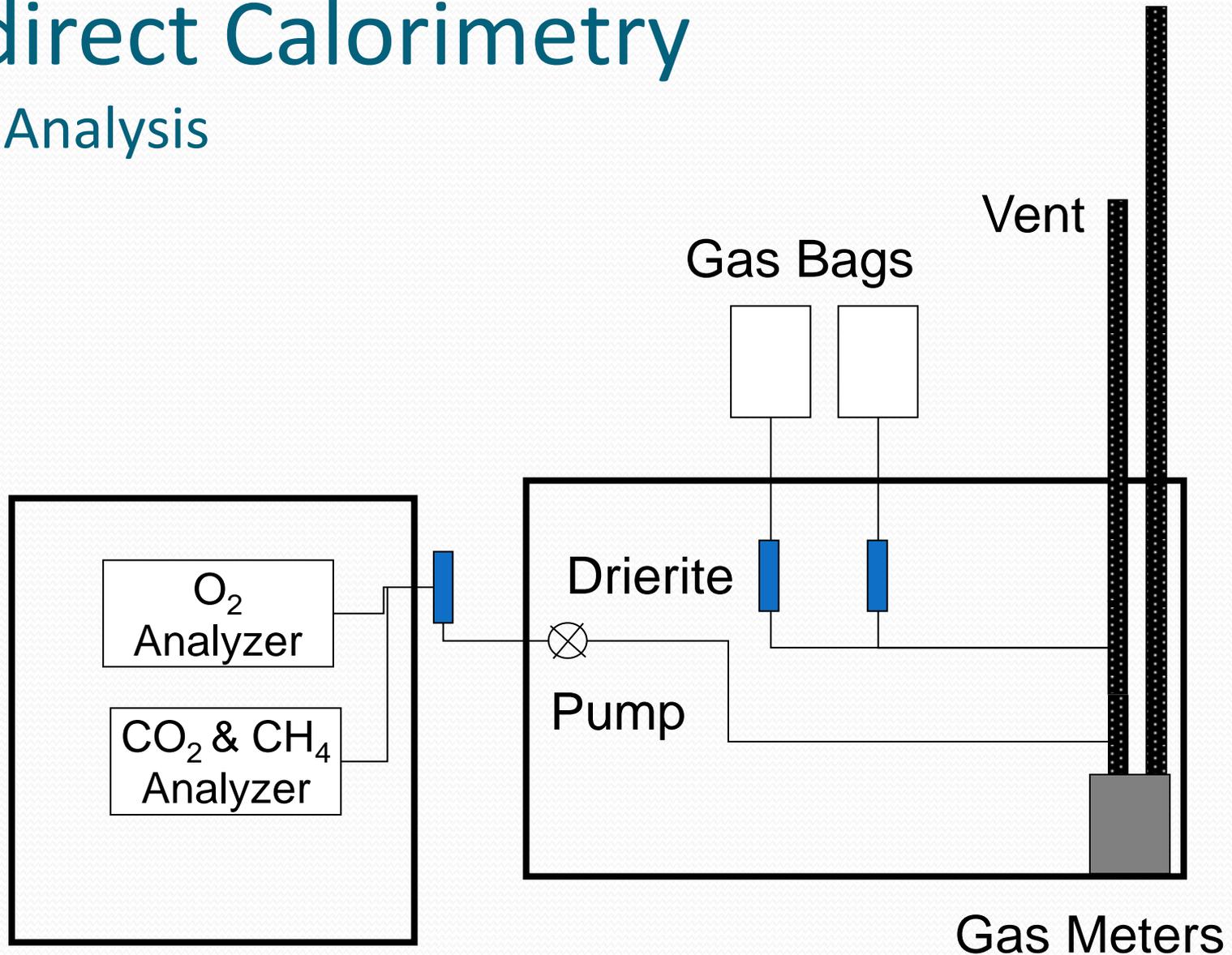
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# Chambers



# Indirect Calorimetry

## Gas Analysis

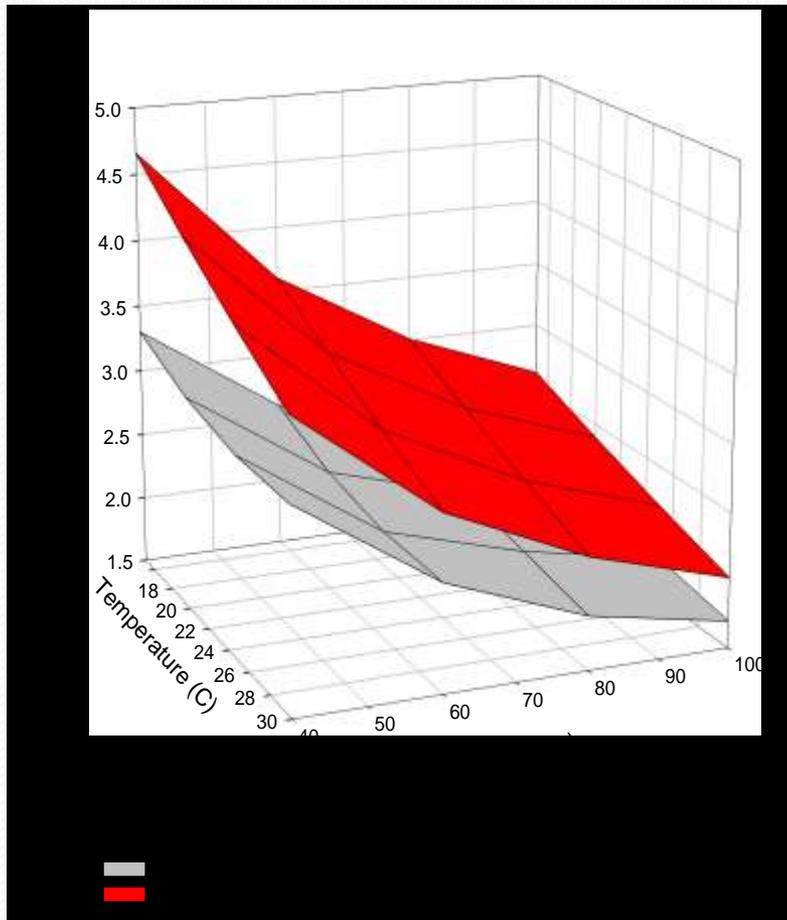


# Indirect Calorimetry

## Gas Analysis

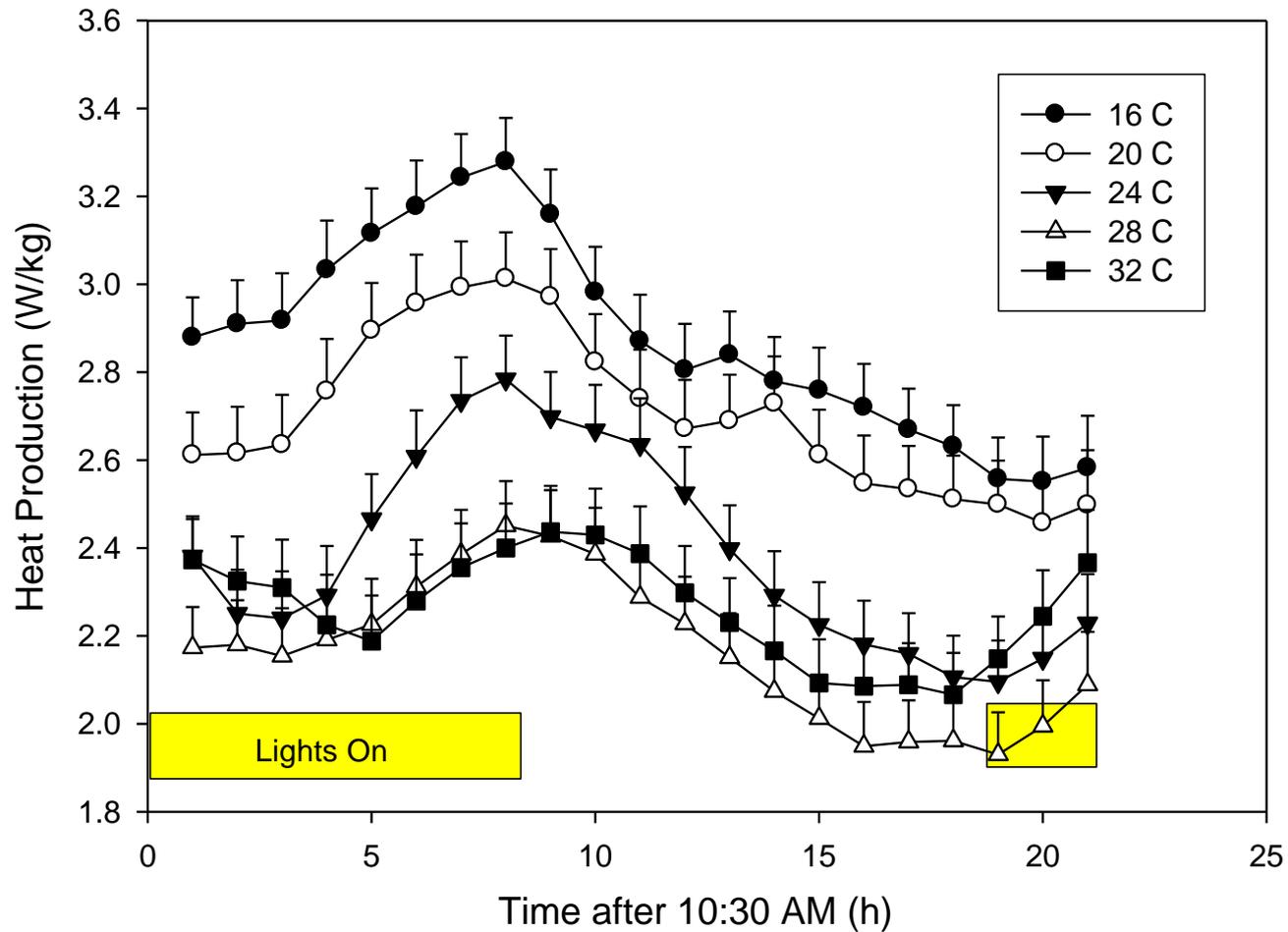


# Heat Production compared to previous standards



- These data indicate HP is 19 - 41 % higher than previous standards

# Dynamic Heat Production-Hourly Values



# Building 64

General Swine Facility

# Heat and Moisture Production

- Setting up a series of building measurements to estimate moisture production



Building 64



# Building 64

- Used to monitor heat and moisture production
  - Gestating Gilt/Sows
  - Finishing Barrows and Gilts
  - Growing Barrows and Gilts
  - Nursery Ages Piglets



09/15/2009

# Building 64

- Animal handling doors
- One was removed and the other was replaced with a new door
- This will ensure a more air tight building





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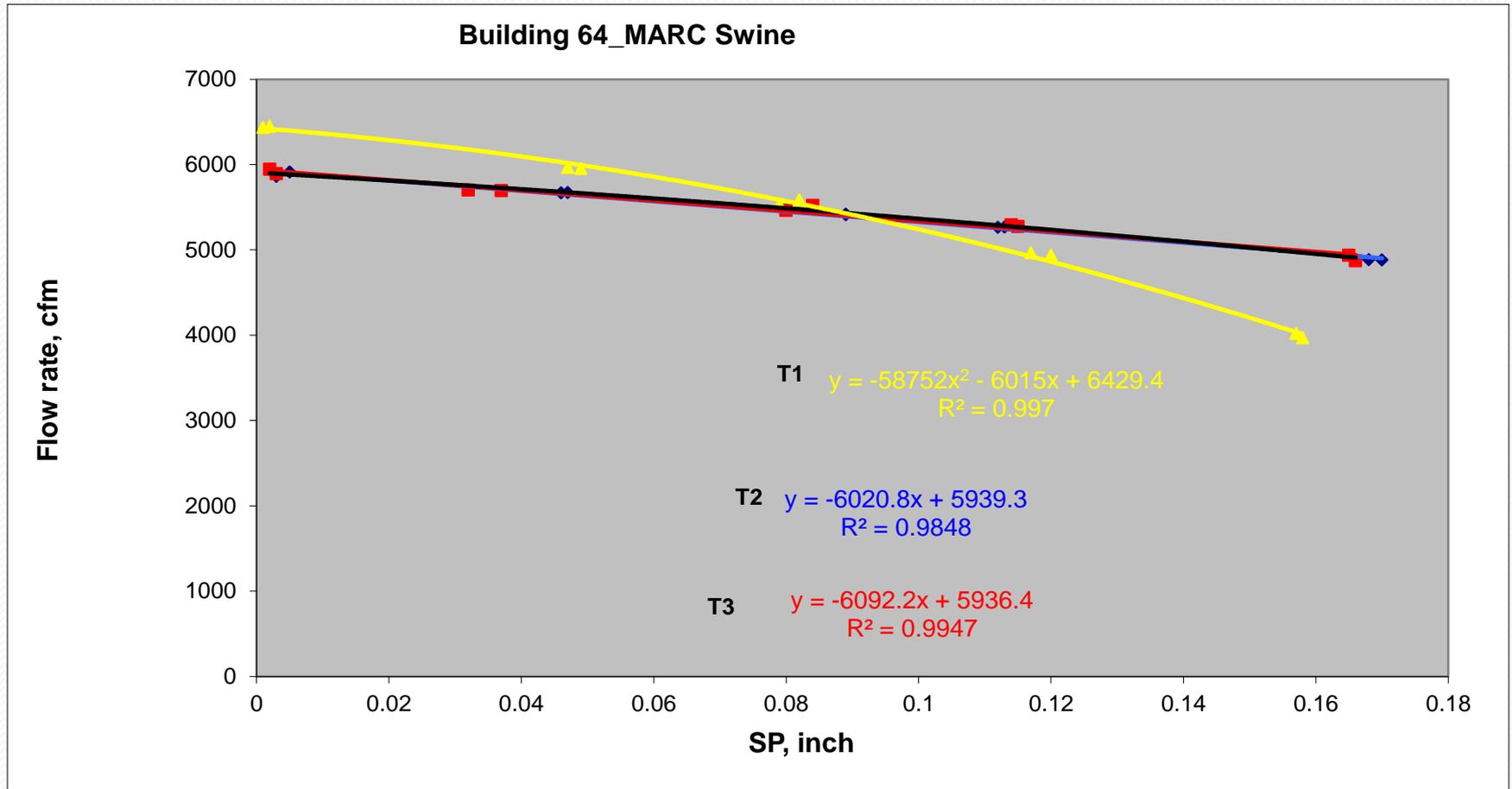
# Installation and Calibration

- Each Fan was calibrated for flow based on static pressure in the building.
- 
- The FANS unit was “sealed to the building





# Calibration Curves



# Instrumenting the Building

- Thermocouples were placed at pig height the length of the building to ensure a good temperature measurement



# Exhaust Air

CO<sub>2</sub>, Temp,  
Moisture, and  
Static Pressure  
are measured  
at the exhaust.



# Inlet Air

- CO<sub>2</sub>,  
Temperature,  
Moisture and  
Barometric  
Pressure are  
measured at the  
inlet



# Instrument cabinet

- All the instruments have been placed in a cabinet in the swine barn.
- A fresh air supply is added to the cabinet to ensure positive pressure in the cabinet which eliminates problems associated with swine dust.

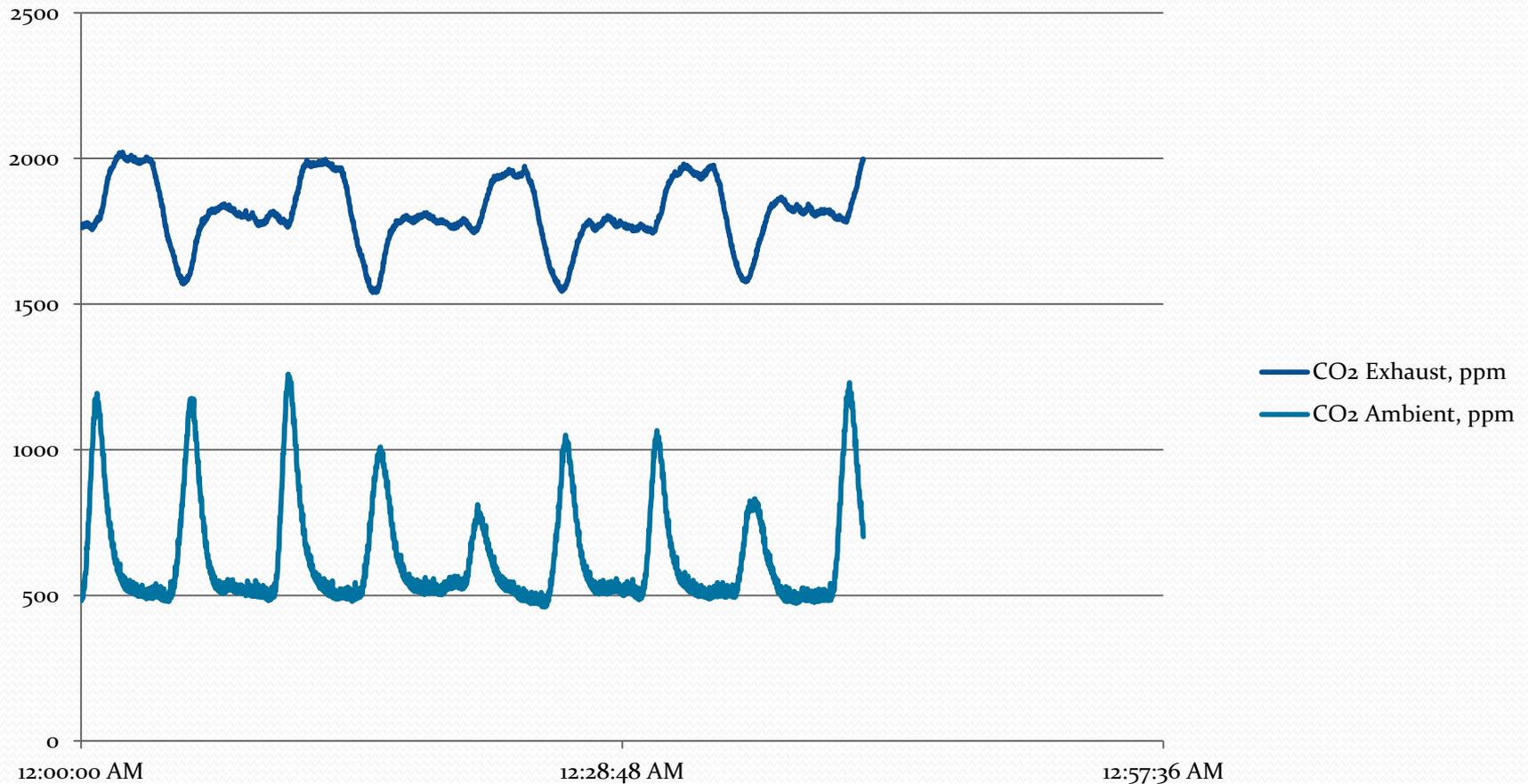


# Instrument cabinet

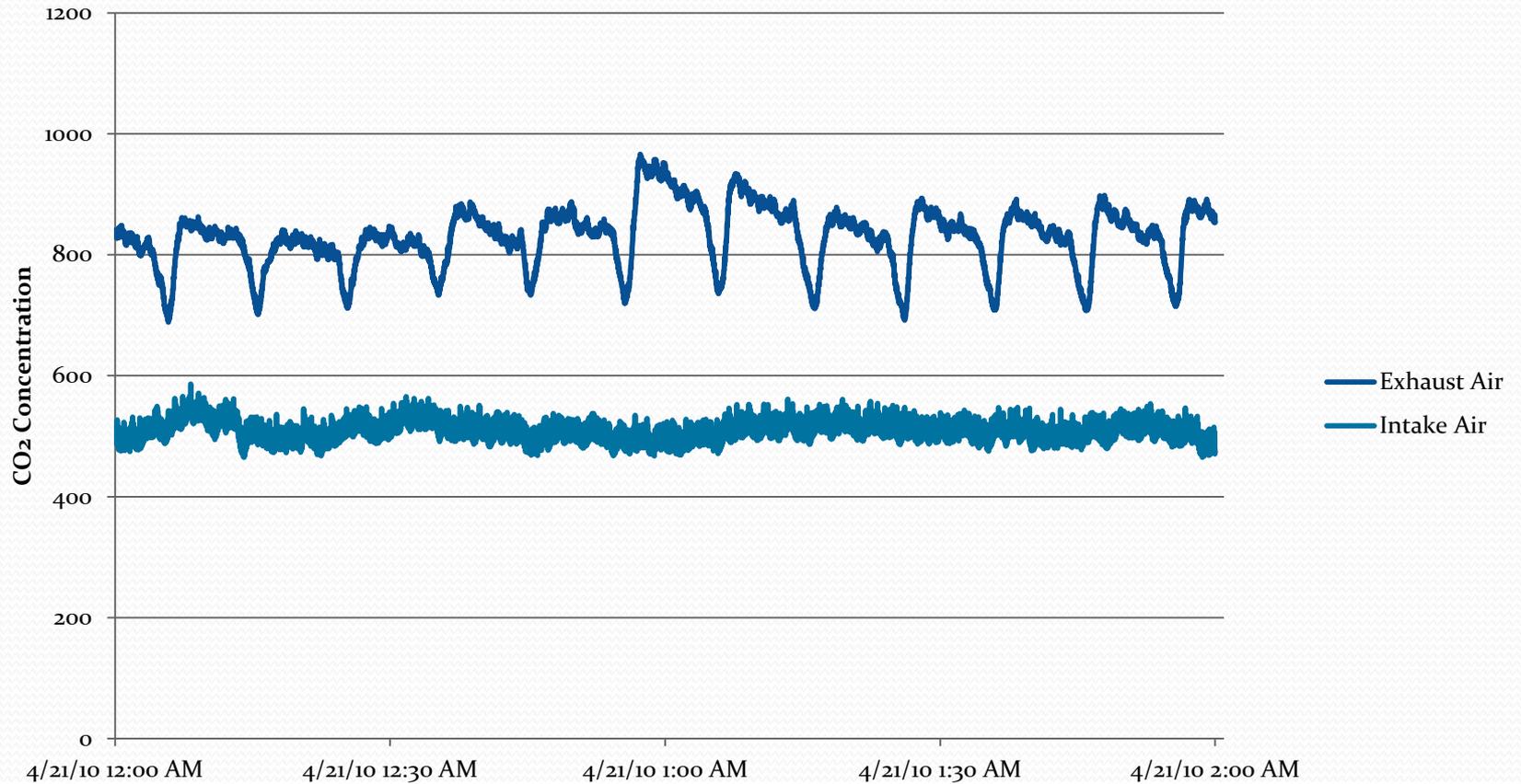
- Air inlet for instrument cabinet



# Sample data (try 1)



# Sample Data



# Questions