COM25-71588 Reducing the air flow in a chemotherapy production unit during a period of rest without compromising environmental parameters during the activity in an eco-responsible approach.

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Introduction

- **The healthcare sector in France :** 49 millions tonnes of CO_2e per year, representing 8% of total greenhouse gas (GHG) emissions.
- **Different areas for improvement :** the use of medications, food, staff/patient transport, waste management, and **infrastructure efficiency.**

Objective : Reduce airflow and adjust temperature during rest periods, while complying with Good Preparation Practices.

Material

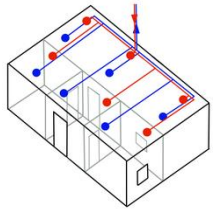
- **Multifunction case TA465-P** (TSI®)
- **Hot-wire anemometer** (articulated)
- **Measuring cone**
- **Bioaerosol sampler MicroBio MB1 400** (Cantium Scientific®)
- **Particle counter AeroTrak® 9350** (TSI®)
- **Air handling unit** (AHU – SAUTER®)

Method

- **Measurements over 2 weeks (in triplicate) :** airflow rates, temperature, relative humidity, differential pressures, particle and microbiological air counts.
- **Rest phase :** gradual reduction of supply airflow (m³/h), extraction pressure (Pa), temperature (°C).

Results

Current AHU setting :
- Temperature : 21°C
- Supply airflow : 2750 m³/h
- Exhaust pressure : 240 Pa



Standby mode (6:00 p.m. to 6:00 a.m.)

Decrease

Setpoint adjustment

1. **Airflow rates only**
   - ↓ 11,7 % exhaust pressure only
   - ↓ Preheating
   - ↑ Heating coil power consumption
2. **Temperature only**
   - ↓ 3°C That is 18°C
3. **Airflow rates + Temperature**
   - ↓ 10 % supply airflow ↓ 30 % exhaust pressure At 18°C

Gains ($kgCO_2e/yr$)

1	2	3
↑ 30	↓ 60	↓ 216	↓ 293

Equivalent to 63 974 batch manufacturing record

Conclusion

- **First study** on airflow optimization in a chemotherapy compounding unit.
- **Reduction of airflow and temperature** : effective strategies to decrease GHG emissions, to be adapted according to the AHU design and the hospital's energy sources.
- **Mandatory validation** through performance qualification.
- **Equipment rental cost** to be anticipated : €2,700.
- **Lowering the temperature to 18 °C during rest periods** (5-Fluorouracil crystallizes at 15 °C): a simple, programmable, and most effective solution to reduce the carbon footprint, compatible with growth/decay kinetics and staff presence.