



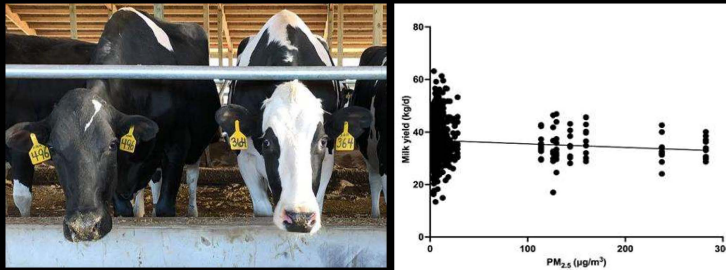
A BURNING PROBLEM - WILDFIRE SMOKE GENERATOR

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VALUE PROPOSITION

- Our product will ensure the viability of the 2-billion-dollar dairy industry by allowing the University of Idaho College of Natural Resources and CAFE to do groundbreaking research on dairy calves
- Utilize test chambers to manipulate smoke exposure to run biological tests on calves – determining how smoke inhalation impacts animal performance and health



DESIGN VALIDATION

- Overall System Functionality
 - Particulate Matter is produced in the 300-350 $\mu\text{g}/\text{m}^3$ range
 - Temperature does not exceed 75 F at time of testing
- Particulate matter and hazardous gases are measured by electronic sensors within each chamber. CO/CO₂ sensors are set at threshold values for humans. Particulate matter is measured with the PupleAir Flex Air Quality Monitor

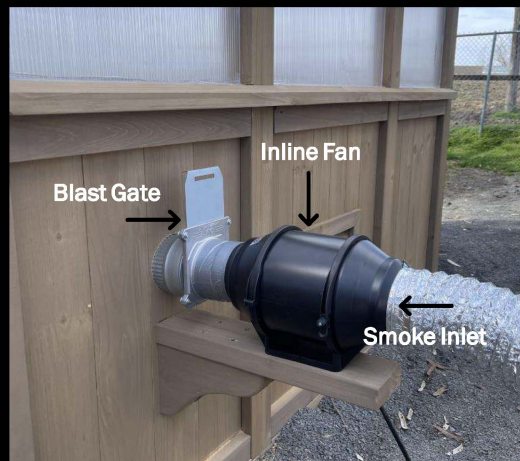
University of Idaho
College of Natural Resources
Dr. Amy Skibiel
Dr. Pedram Rezamand

SMOKE PRODUCTION SYSTEM

- Masterbuilt 30" Smoker with 3 holes ensuring smoke distribution to the 6 chambers
- Manual wood chip loading mechanism to ensure continuous smoke production



DUCT WORK



HOW IT WORKS

- Heating element in the smoker burns wood chips, producing smoke
- Smoke is distributed to 3 of 6 chambers via manifolds, ducting, and inline fans
- Particulate matter and hazardous gases are measured by electronic sensors within each chamber



FUTURE WORK

- Automation of the variable fan smoke delivery system
- Create a permeant consumable air fan compartments
- Establish permeant exhaust fan locations
- Multiple smokers for larger testing capabilities
- Create a streamlined data collection system for purple air sensors



University of Idaho
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