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# HANDS OFF THE MINK!

USING ENVIRONMENTAL SAMPLING FOR SARS-COV-2 SURVEILLANCE IN AMERICAN MINK.

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## BACKGROUND

- American mink **highly susceptible** to COVID-19
- Human to Mink, Mink to Mink, Mink to Human transmission
- **High rate of virial mutation**
- **Covid-19 detected on a BC mink farm on April 21<sup>st</sup>, 2021**



## HOW DO YOU TEST A MINK?



- Live and Mortality sampling
- Variable **morbidity mortality** during outbreaks
- **Fractious** nature/Tricky nares

# STUDY OBJECTIVES

1. Can we use environmental samples instead?
2. What kind of environmental samples? Cage? Manure trough?
3. Do environmental samples contain enough viral RNA to sequence?

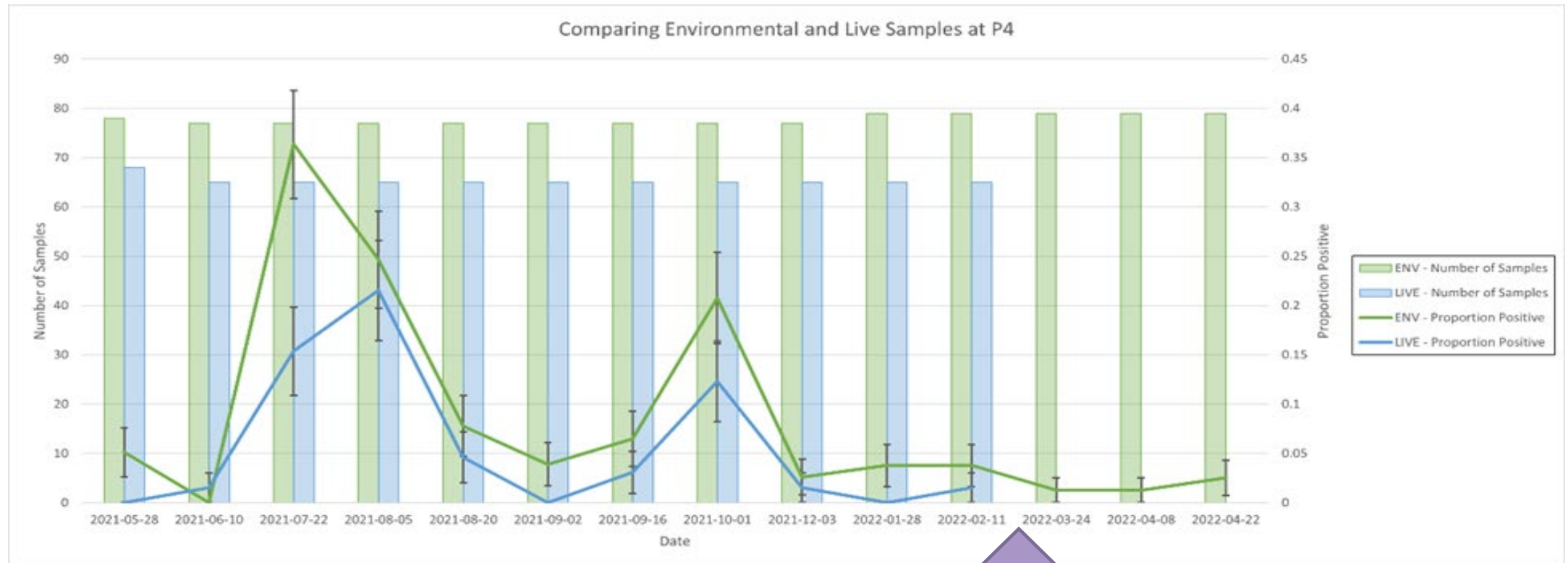


## METHODS

- Approximately biweekly sampling of 65 live mink, 65 cages and 12 manure troughs
- Constant sampling for mortalities
- Samples analyzed with PCR



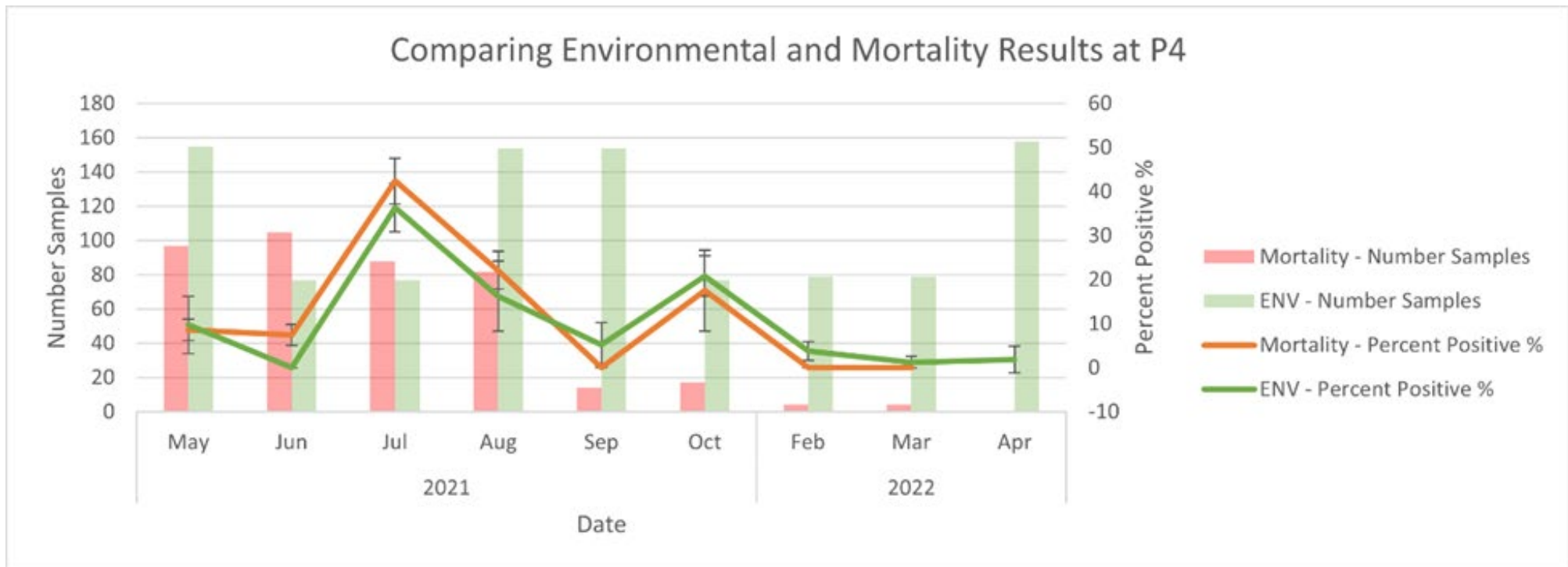
# ENVIRONMENTAL SAMPLES APPEAR MORE SENSITIVE THAN LIVE



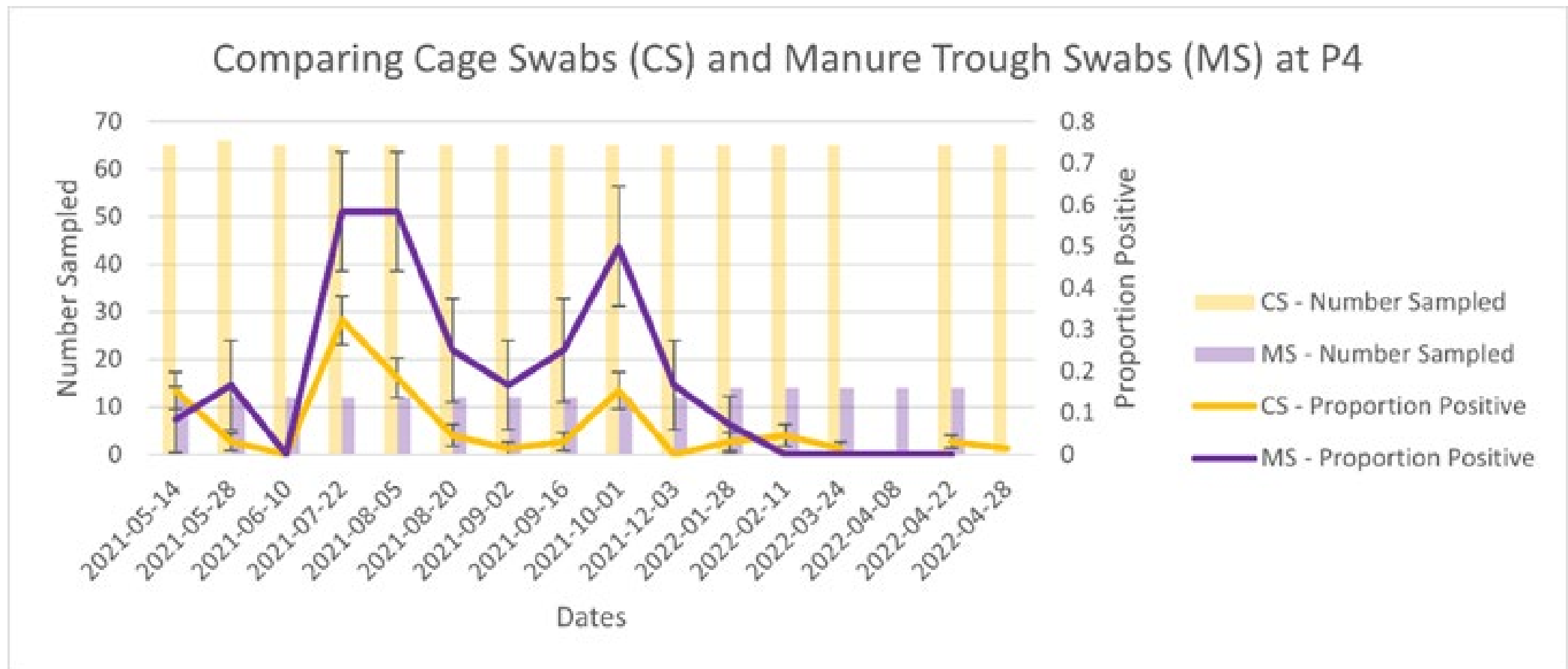
At the cage level, there was **moderate agreement** between live and environmental samples ( $\text{Kappa} = 0.45$ )

Premise remained **Positive AFTER** depopulation

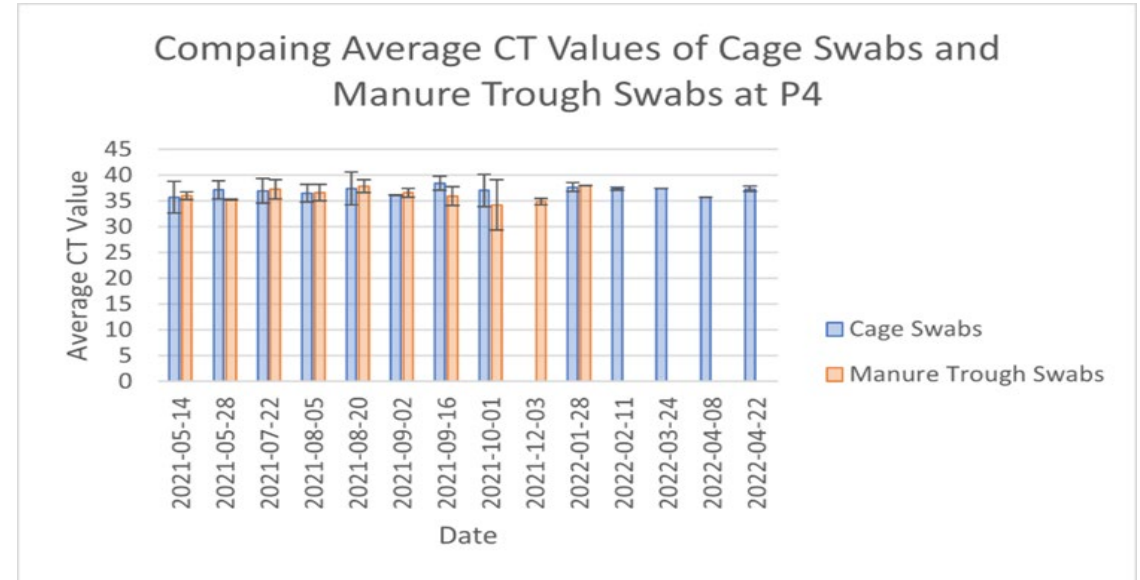
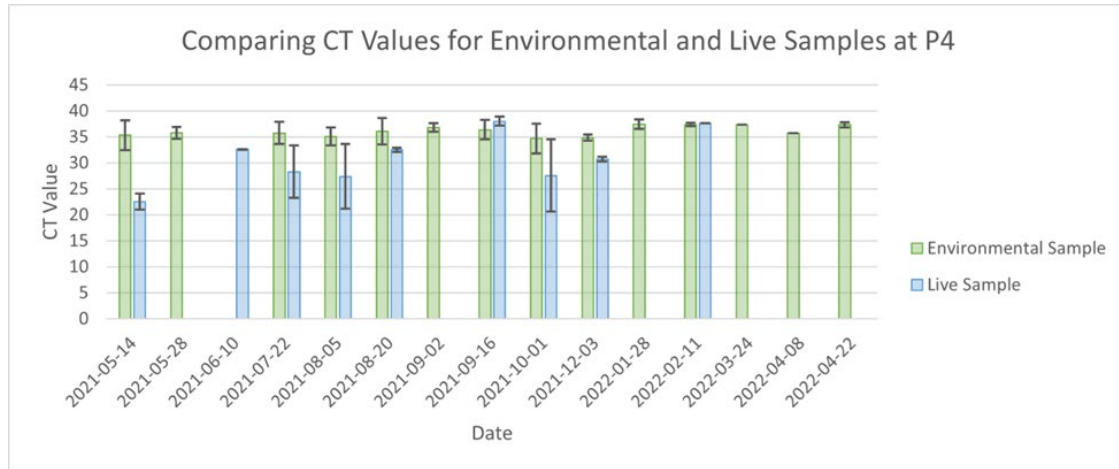
# ENVIRONMENTAL SAMPLES APPEAR AS SENSITIVE AS MORTALITY SAMPLING



# MANURE SWABS APPEARED MORE SENSITIVE THAN CAGE SWABS BUT ONLY THE CAGE REMAINED POSITIVE AFTER DEPOPULATION







Average CT values for environmental and live animal samples were 36.2 (IQR = 2.1) and 30.8 (IQR = 7.6), respectively ( t-stat= 2.685, p-value = 0.031)

The average CT values for cage swabs was 36.99 (IQR= 0.90) and for manure trough swabs was 36.29 (IQR= 1.65) (t Stat= 1.5, p-value= 0.153)

**MAY NOT BE ABLE TO GET SUFFICIENT RNA FROM ENVIRONMENTAL SAMPLES FOR SEQUENCING**

## TAKE HOME MESSAGE

- Environmental samples can be a good alternative or compliment to historical sampling methods
- Environmental samples have relatively less RNA and may require alternative sequencing techniques
- RNA persistence in certain substrates may impact specificity.

