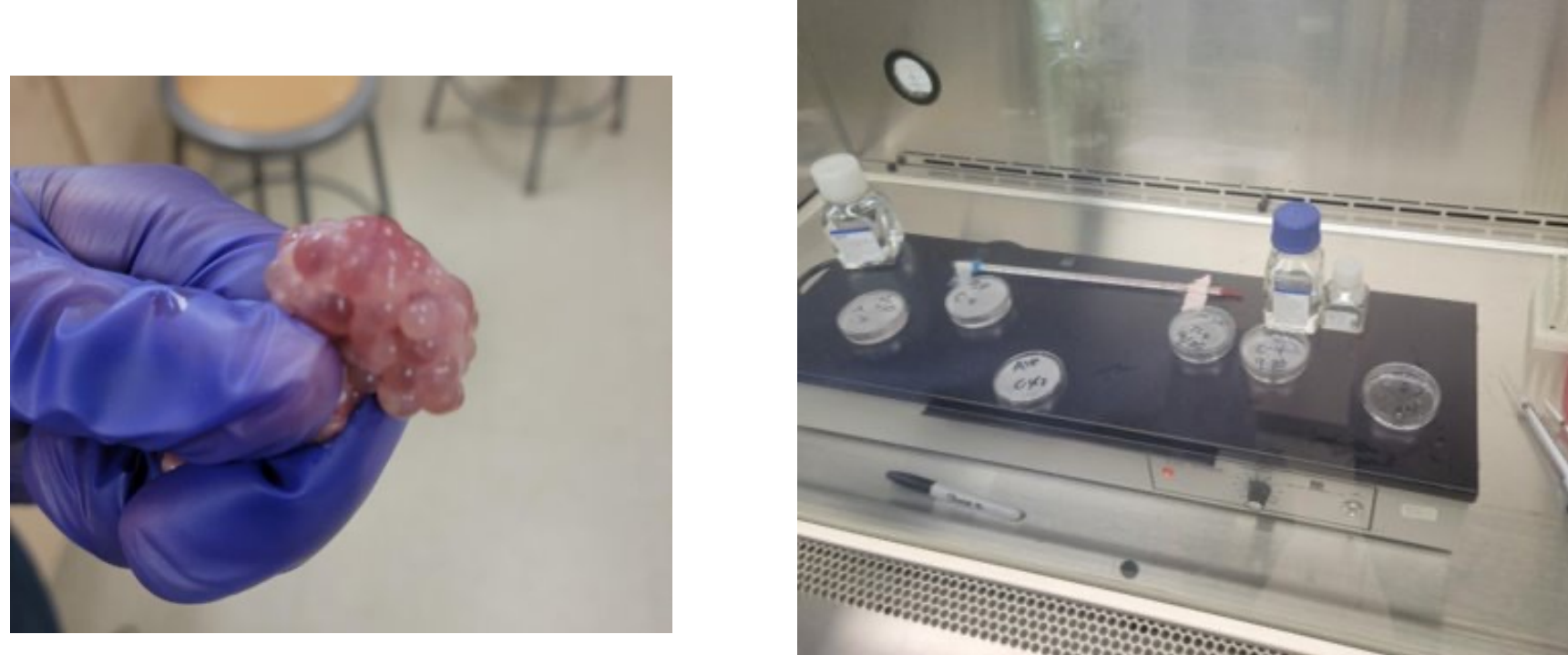


# Post-Mortem Ovary Viability

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## Abstract

The goal of this experiment was to evaluate the viability of ova in post-mortem porcine ovaries at different temperatures. This was chosen with the aim to aid farmers who might have an animal with prized genetics pass away prematurely. While the group predicted that differing temperatures would negatively impact ova viability, results show that there was no notable difference in viability between the Control group ovaries that were incubated at 97.7° F and the Test group that ranged from 72° F - 101.1° F. From this we can conclude that taking ovaries down to these temperatures within the same day as death will not significantly impact their ability to be used in IVF procedures. However, further testing is recommended.



## Introduction

This project was performed in the Delaware Valley University Student Research Laboratory with ovaries collected from terminal animals being processed by Springfield Meat. Ovaries were set aside by employees of the company the morning of each test, collected by students, and transported in an insulated container. Once at the lab, a control group was identified and placed in an incubator at 97.7° F. The variable group was left out of the incubator and temperature was manipulated to deviate from that of the source animals. Over a several hour period, each ovary was aspirated, eggs were identified and collected utilizing a microscope, and they were placed into a media either for In Vitro Fertilization (IVF) or In Vitro Maturation (IVM) depending on the stage of the project students were in. Eggs were assessed the following day utilizing analysis of degradation, presence or absence of polar bodies, and visuals of the corona radiata to determine viability.

## References & Acknowledgements.

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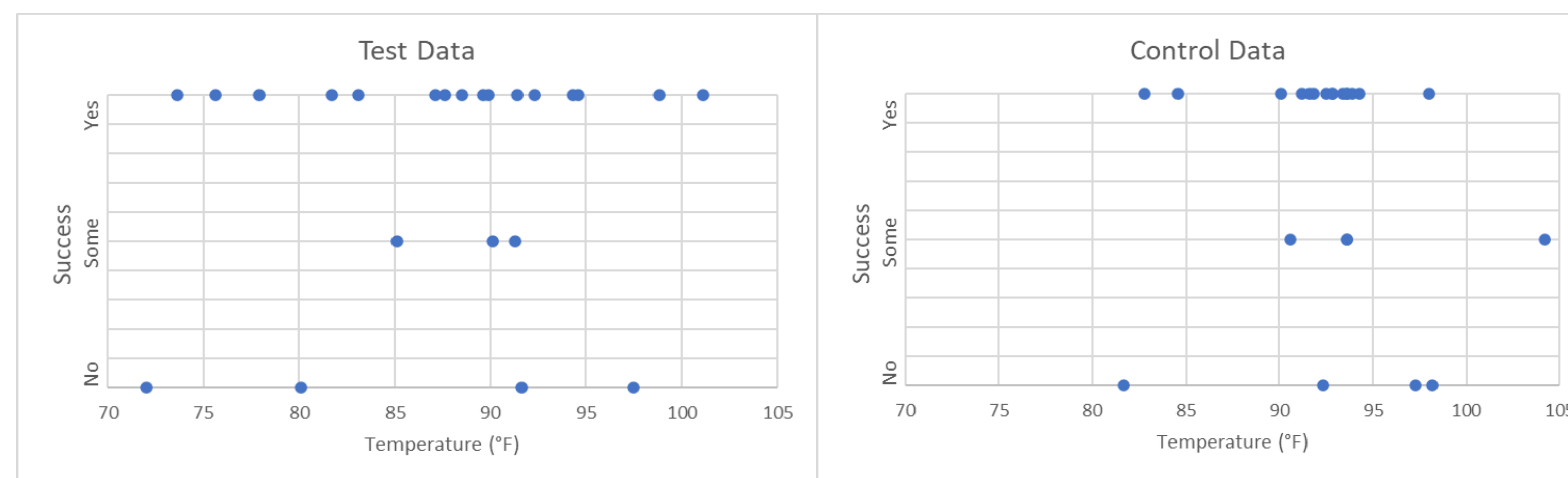
With special thanks to our mentors Dr. Robin Shedlauskas and Dr. William Fritz for their guidance, and to Chip from Springfield Meat for the donation of swine ovaries

## Methods

- Ovary collection from Springfield Meat
  - Collection with gloves and scalpel
  - Insulated box with hot hands and chlorohexidine
- Separation into T and C groups
  - Bloody or abnormal looking ovaries avoided for testing when possible, but distributed evenly between groups
  - T ovaries placed on a heating pad
  - C ovaries placed in 97.7° F incubator
- Ova collection
  - Aspiration with syringes of Asp fluid and luer lock needles
  - Fluid mixture deposited into an Asp plate
  - Plates assessed under microscope and ova collected with micropipette tips on syringes
  - Plates made up of drops with either IVF™-30 or Ham's fluid, covered in mineral oil or OVOIL™
    - During IVF, sperm underwent swim-up and were deposited into the drops after completion of all plates
  - All plates were incubated at 97.7° F and were assessed the following morning for viability
    - Morphology
    - IVF – Successful fertilization
    - IVM – Successful maturation

## Results

A total of 23 runs were completed for this project over the course of 4 weeks. In this time, a total of 385 eggs were collected from 46 separate ovaries. The Test group ultimately had a "Yes" rate of 69.6%, with 16 separate ovaries having ova clearly viable after the run. 3 of the runs resulted in only "Some," returning a 13.0% rate for this. 4 of the Test runs were entirely void of success, meaning that 17.4% of the trial ovaries were not viable the next morning. Of the control group, similar numbers were found. 15 of the ovaries were classified as "Yes," giving a 65.2% full success rate. "Some" was the result found in 4 of the Control runs, and represented 17.4% of the Control group. 4 of the ovaries aspirated had no viable eggs the following morning, representing the last 17.4%. All numbers can be viewed for comparison in the following table:



Note that the "Some" point at 93.6°F represents two separate data points with the same temperature and success rate

	N	T	% of T	C	% C
Yes	31	16	69.6%	15	65.2%
Some	7	3	13.0%	4	17.4%
No	8	4	17.4%	4	17.4%

For the purpose of our research, "Yes" means that >2 ova were found to be viable, "Some" means between 1-2, and "No" indicates that none were viable.

## Discussion Application

While the results of our research show that the temperatures the ovaries were brought to did not impact viability, they are still useful. Primarily, these results show that ovaries can be collected from deceased animals that have cooled to some extent and still be utilized. This could prove useful for farmers who have deceased livestock, specifically animals that have died to predators or of other causes prematurely. Given that the animal is still within the temperature bounds of this experiment, there is a reasonable chance that the eggs of that animal can still be utilized for IVF and embryo transplantation if a facility is available. While this may be an unrealistic expense for production facilities, it could be useful to those with highly expensive showstock or those trying to preserve heritage breeds.

## Conclusion

Results from this research show that viability of swine ovaries that are held at 97.7° F and those taken to temperature points between 72° F - 101.1° F are not significantly different. While this conclusion can be helpful as is, further research is recommended to provide better guidance for those who are considering IVF with ova from deceased animals: noting how much time has passed since the ovaries were in the living pig and time passed since being at incubation temperature would be useful due to the extra ability to assess time since blood oxygenation and time since ideal temperature. Another item of consideration for further testing would be having a series of incubators in order to incubate plates at differing temperatures. The experiment that was performed here was only able to take the ovaries to deviated temperature points. After collection they were all incubated at the same temperature due to only having one incubator. Incubation at entirely different temperatures might return results more pertinent to circumstances of finding animals deceased.