

# WHY DID THE SALMONELLA-SPIKED CHICKEN CROSS THE AUGER?

*Adventures in Interdisciplinary Research Risk Assessment*



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# GEORGIA TECH

Located in Atlanta, Georgia

14,500 undergrads, 8,500 postgrads

5,500 academic and research staff

\$1.88 billion endowment



GEORGIA TECH



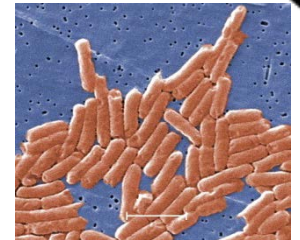
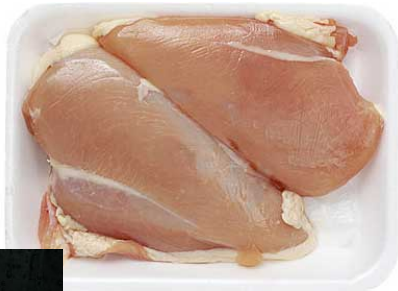
# IT ALL STARTED WITH A PHONE CALL

In late 2014, a PI in the Food Processing Building contacted the Biosafety Office.

He was planning on spiking chicken carcasses with *Salmonella* to measure the antimicrobial effect of chlorinated ice slurry.

He wanted training for his lab.

# AT FIRST, IT SOUNDED LIKE A ROUTINE PROJECT



BSO



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# UPON FURTHER DISCUSSION...

We found that the project was well beyond the “norm” for campus:

- Whole chicken carcasses
- An environmental chamber in the middle of a high bay warehouse
- Trash can with aquarium heaters as the “incubator”
- 12’ long food processing auger as the “water bath”
- Industrial sized slurry machine
- Antibiotic-resistant strain of *Salmonella*
- PI’s 1<sup>st</sup> project working with microorganisms

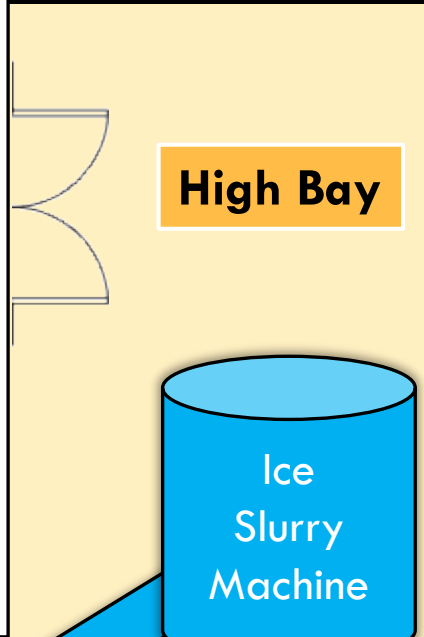


# SUMMARY OF INITIAL PROJECT PLAN

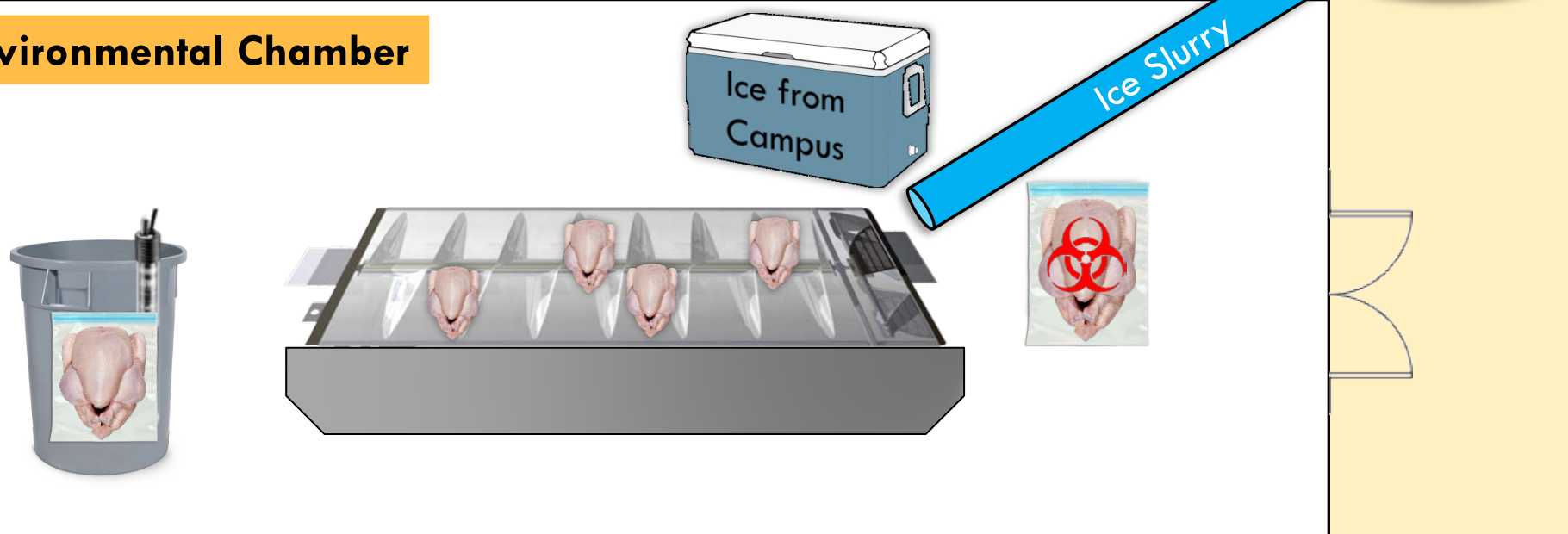
1. Inoculate whole chicken carcasses in BSC of BSL-2 lab with *Salmonella*; place in plastic bags
2. Cart chickens to environmental chamber through high bay
3. Add chickens to trash can sized incubator for overnight incubation
4. Add chickens to chlorinated ice bath in auger after removing them from bags:
  1. Ice slurry (from slurry machine in high bay)
  2. Traditional ice bath (getting ice from cafeterias & sports medicine areas on campus)
5. Run the auger (moving parts, water jets, no lid or containment)
6. Remove chickens from the bath and cart back to the BSL-2 lab
7. Isolation of tissue on open bench, then place in stomacher on open bench



# INITIAL PROJECT PLAN

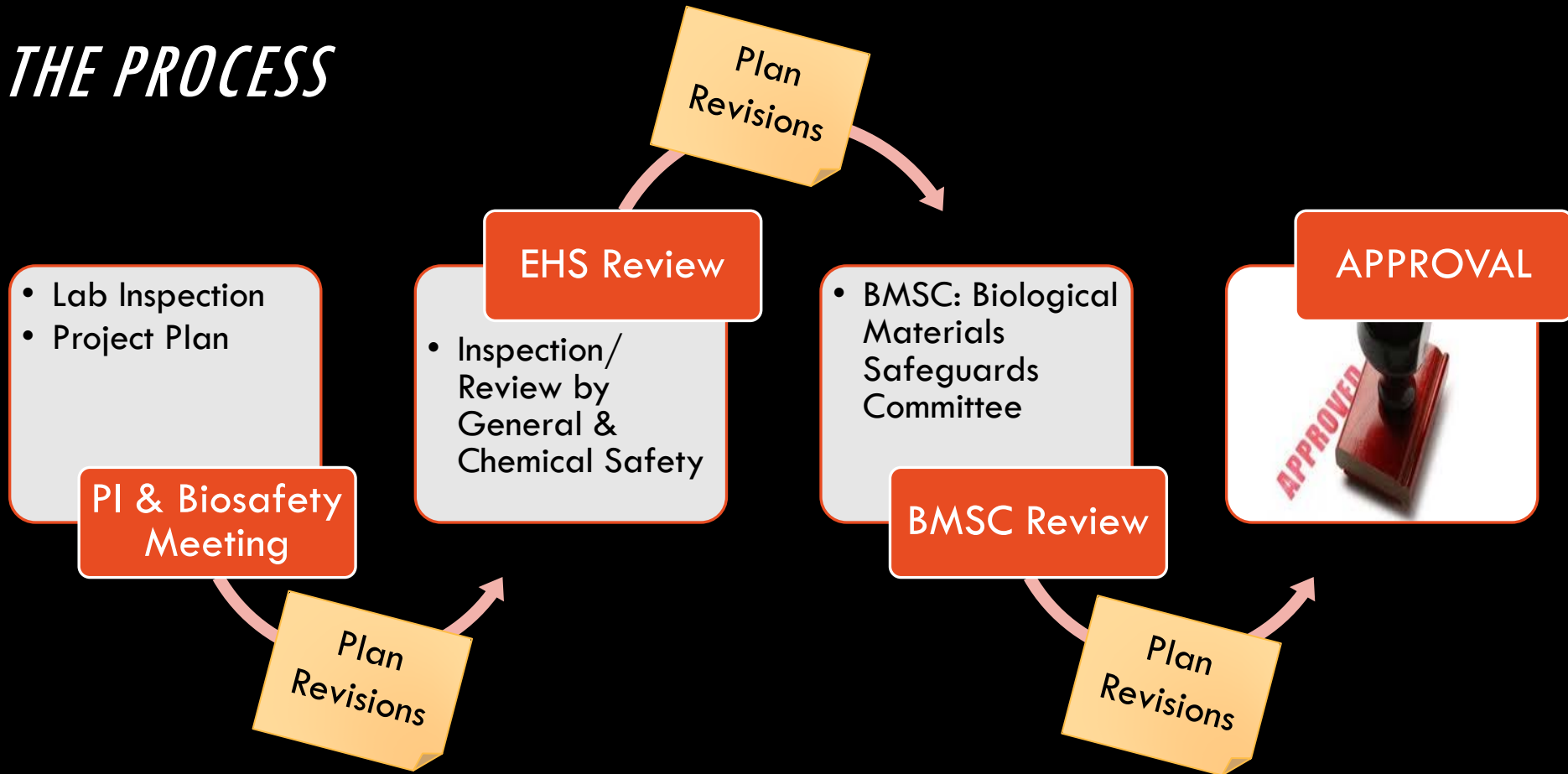


## Environmental Chamber



# WE NEED A RISK ASSESSMENT!

## THE PROCESS



# STEP 1: PI & BIOSAFETY MEETING

- Conducted an inspection and walkthrough of the proposed research area
- Reviewed written biological hygiene plan and research proposal

## **Concerns Raised to PI:**

- Use of the environmental room
  - No sink, eyewash, safety shower
  - Suspicious of lab ventilation
- Use of antibiotic resistant strain
- Transport of materials between BSL-2 lab and environmental room
- Use of ice from campus food service and sports medicine areas
- Lack of primary containment during use of auger
- Aerosols generated by the auger
- Messy slippery process around the auger during loading and unloading

## STEP 2: EHS REVIEW/INSPECTION

- PI removed the traditional ice bath phase of the project and added decontamination SOPs
- PI provided justification for use of Salmonella strain
- The Biosafety Office reached out to the General Safety and Lab/Chemical Safety Managers for assistance

### **Concerns Raised to PI:**

- The environmental room has no ventilation
  - Needs renovation or new location for project
- Auger's moving parts exposed
  - Has emergency stop but no signage
- Electrical safety issues with the trashcan incubator
- High potential for slips, trips and falls
  - Can procedure modification and slip resistant boots help reduce the risk?

# STEP 3: BMSC REVIEW

- No funding or time available to renovate the environmental chamber, so auger was moved to BSL-2 lab
- Revised SOPs to address electrical safety and slips, trips and falls issues
- Biosafety still felt that the lack of containment while the chicken was in the auger was a problem but was having trouble getting the PI to change project design

## Concerns Raised to PI:

- What about other potential pathogens on the chicken?
- Need to address aerosolization – can lab design a fix?

# LID DESIGN

*We can do that...*

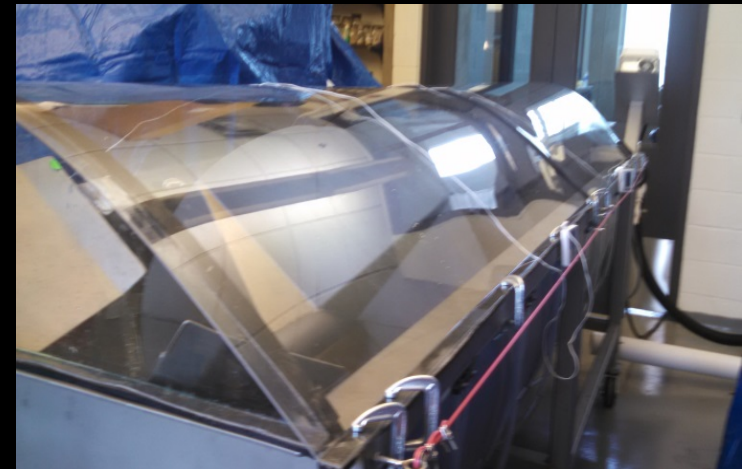


After a few trials and errors, the lab was able to design and manufacture and plastic lid for the auger:

- Sealed around the top of the auger
- One end included a HEPA filter
- Other end had a window that could be opened to add and remove chicken carcasses

SOPs were written for use of the lid:

- Seal testing
- Decontamination of HEPA filter, auger and lid
- Operation of the window and auger jets



# STEP 4: BMSC APPROVAL

With changes made to the equipment, a final meeting was conducted with the lab and the Biosafety Office

Approval (for three years) was granted from the BMSC and the lab commenced their work



# FINAL PROJECT PLAN

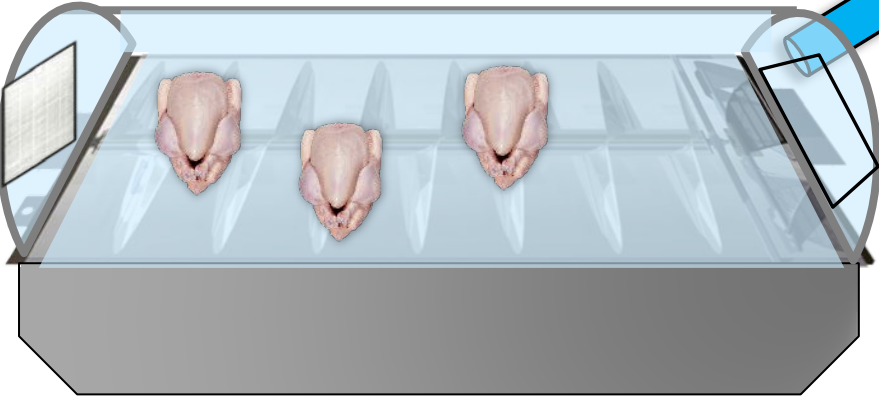


**BSL-2 Lab**

**High Bay**

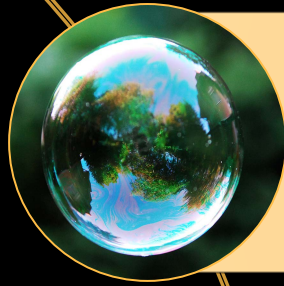


*Ice Slurry*





# LESSONS LEARNED



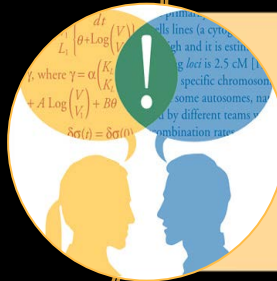
## ***Break out of your biosafety bubble***

- Engage non-biosafety EHS team members for a comprehensive assessment



## ***Be collaborative with your researchers***

- Use their creativity and knowledge to your advantage



## ***Look in unexpected places for bio-related research***

- Interdisciplinary research is increasing
- We, as biosafety professionals, need to make sure that they know we exist



## ***Faculty-led committees are a huge resource***

- Outcome of protocol review comes from the PI's peers – not EHS
- Make sure they know you appreciate them!

# NEXT STEPS

Change of disinfectant in ice slurry

Evaluating other lab areas so that the auger can be moved out of the small BSL-2 lab and into another appropriate space

Working to be engaged earlier in the funding process with the Georgia Tech Research Institute

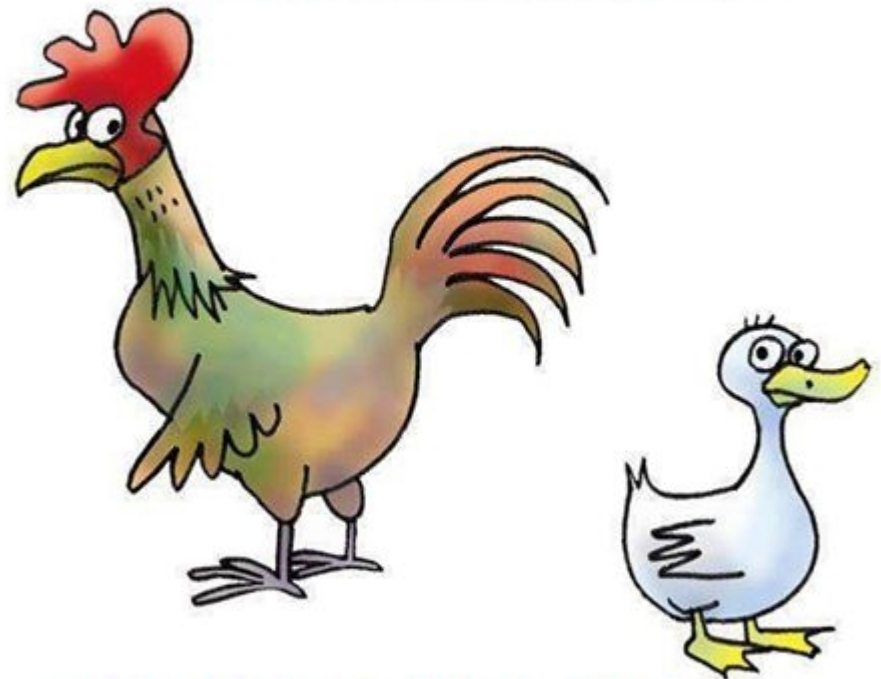
- Working off of shorter term contracts instead of federal grants



# QUESTIONS



A duck was about to cross the road when a chicken looked at him and said....



"DONT DO IT MAN.... YOU WILL NEVER HEAR THE END OF IT!"