Title: GVI: Straw Stamp and Slicer

Date: 12/4/2025

Client: Sarah Hanson, Brett Breidor, and Ben Goss
Advisor: Professor Justin Williams
Team:

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Problem statement

Currently, quality control procedures investigating quality of bull semen for artificial insemination are time and labor intensive. The process involves cutting and pushing bull semen through a small straw using a straightened paper clip, and transferring the contents to a 96-well plate. This process takes one hour, with 8-10 plates being processed per day. The purpose of the project is to optimize these quality control procedures by designing a straw slicer that should be able to cut 12 straws at a time. It should also have removable components for cleaning. Additionally, a straw stamper is needed to push bull semen out of the straws in bulk, avoiding cross contamination.

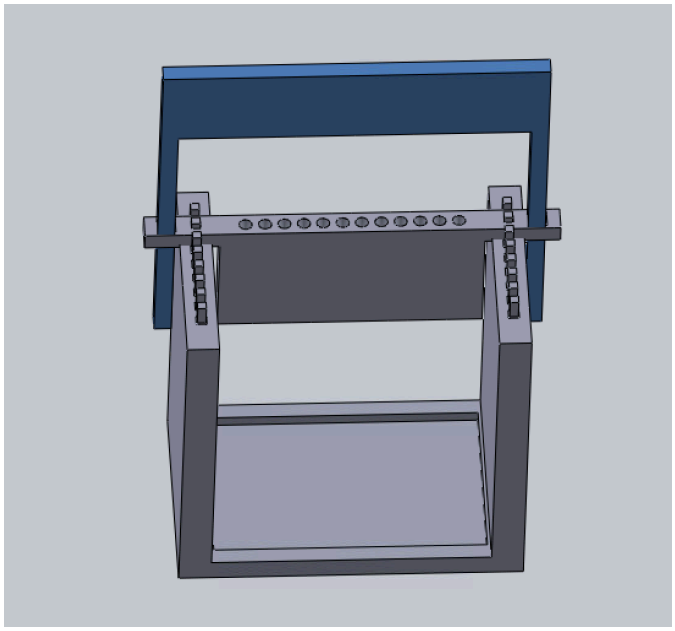
Brief status update

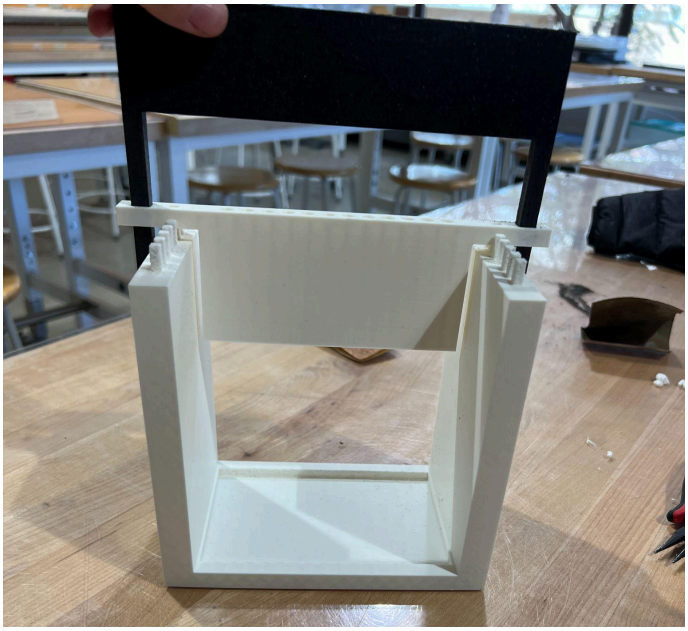
This week, we worked on finishing our poster presentation and wrapping up any testing and 3D printing. On Monday, we ran a contamination test using fluorescein which concluded that there was no contamination between the straws during the procedure. We also used our fixture to perform a full procedure, and determined that our new device reduced 40% of the original time. Additionally, we created an alternative stamper without handles, and also 3D printed our compartments in resin.

Difficulties / advice requests

N/A

Current design





Materials and expenses

Note:

- Allocated $50.00 in payment account through UW-Madison to use at Makerspace

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Materials										
3D Print	ABS single compartment prototype, Ø 2mm straw hole	-	-	Makerspace	-	10/10/2025	3.81	$0.05	$0.19	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
3D Print	ABS single compartment prototype with Ø 2.5mm and Ø 3mm straw hole. Stamper rod holder prototype Ø 1.5mm	-	-	Makerspace	-	10/13/2025	16.23	$0.05	$0.81	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
3D Print	ABS 12 compartments together prototype with Ø 3mm straw hole.	-	-	Makerspace	-	10/22/2025	31.4	$0.05	$1.57	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
3D Print	MTS test fixture, updated single compartment prototype with smaller diameter hole, and well plate frame	-	-	Makerspace	-	10/27/2025	45.8	$0.05	$2.29	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
1mm Steel Rods	12Pcs 1 mm x 300 mm 304 Stainless Steel Round Rod, Metal Shaft, Stainless Steel Smooth Rods for Industry, Metalworking Hobbies and DIY Crafts (12, 1mm x	Lyrlidr	-	Amazon	B0F8VG5HJV	10/27/2025	1	$6.45	$6.45	https://www.amazon.com/Lyrlidr-Stainless-Industry-Working-Hobbies/dp/B0F8VG5HJV/ref=sr_1_1_sspa?

	300mm)									
UV Detection Dye	Supercool UV Leak Detection Dye, 1 oz. Multi-purpose, Total Dye	TSI Supercool	672264016525	Amazon	B008PKV07O	10/27/2025	1	$7.46	$7.46	https://www.amazon.com/UV-Leak-Detection-Dye-oz/dp/B008PKV07O?th=1
3D Print	MTS Test Fixture (updated diameter sizes)	-	-	Makerspace	-	11/6/2025	31.13	$0.05	$1.56	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
3D Print	ABS 12 compartments, base well plate frame, and stamper	-	-	Makerspace	-	11/10/2025	212	$0.05	$10.60	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
3D Print	ABS 12 compartments reprint with smaller holes	-	-	Makerspace	-	11/17/2025	31.2	$0.05	$1.56	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=1

Major team goals for the next week

1. Finish final report
2. Give GVI our final design

Next week's individual goals

- Catie King
    - Finish report
    - Finishing fabrication touches on compartments
- Lydia Miller
    - Finish report
    - Finalize designs
- Megan Lee
    - Finish sections of final report

    - Ensure everything printed and is ready to be handed off
- Janice Amornthanomchoke
    - Finish my assigned sections of the final report
    - Ensure all final deliverables are complete and submitted on time
- Varenya Vegesna
    - Finish my section of final report
    - Make sure everything is submitted and uploaded to website
- Emma Stroshane
    - Finish sections of final report
    - Finalize finances

Timeline

Week	Description	Status
9/8-9/12 Week 1	Weekly Team Meeting 1	Completed
	Client Meeting to answer questions/discuss project	
9/15-9/19 Week 2	Weekly Team Meeting 2	Completed
	PDS Draft Due 9/19	
9/22-9/26 Week 3	Weekly Team Meeting 3	Completed
	Design Matrix due 9/26	
9/29-10/3 Week 4	Weekly Team Meeting 4	Completed
	Preliminary Presentation 10/3	
10/6-10/10 Week 5	Weekly Team Meeting 5	Completed
	Preliminary Deliverables due 10/8	
	Decide on final design by 10/10	
10/13-10/17 Week 6	Weekly Team Meeting 6	Completed
	Review Preliminary Presentation Feedback	
	Submit IDR by 10/17	

10/20-10/24 Week 7	Weekly Team Meeting 7	Completed
10/27-10/31 Week 8	Weekly Team Meeting 8	Completed
	Show and Tell on 10/31	
11/03-11/07 Week 9	Weekly Team 9	Completed
11/10-11/14 Week 10	Weekly Team Meeting 10	Completed
11/17-11/21 Week 11	Weekly Team Meeting 12	Completed
11/24-11/28 Week 12	Thanksgiving Break (11/27-11/30)	Completed
12/01-12/05 Week 13	Final Presentation on 12/5	Completed
12/8-12/12 Week 14	Final Deliverables due 12/10	

Previous week's goals and accomplishments

- Complete all testing
- Print final version of stamper, frame, and components using Nylon
- Finalize slicer idea, including creating and printing "cover" piece

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Catie King	11/30 - 12/4	- Contamination testing - Analyzed contamination test results - Worked on poster - Finishing fabrication touches on resin stamper - Practiced poster	3 2 1 2 1	9	43.5
Lydia Miller	11/30 - 12/4	- Tested rod forces and analyzed data	2	8	43

		- Contamination testing - Poster - Practice poster	3 2 1		
Megan Lee	11/30 - 12/4	- Redesigned stamper - Worked on poster - Contamination testing - Reprinting	1 2 3 1	7	44.5
Janice Amornthanomchoke	11/30 - 12/4	- Tested forces on rod and tested preparation steps for contamination testing (from Thanksgiving break) - Worked on poster - Practiced presentation for Friday	1 1 .5	2.5	28.25
Varenya Vegesna	11/30 - 12/4	- Worked on poster - Practiced presentation - Updated website	1 1 0.25	2.25	27.75
Emma Stroshane	11/30 - 12/4	- Worked on poster - Practiced presentation - Worked on updating BPAG table	1 1 0.25	2.25	33.75