

Title: GVI: Straw Stamp and Slicer

Date: 11/6/2025

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

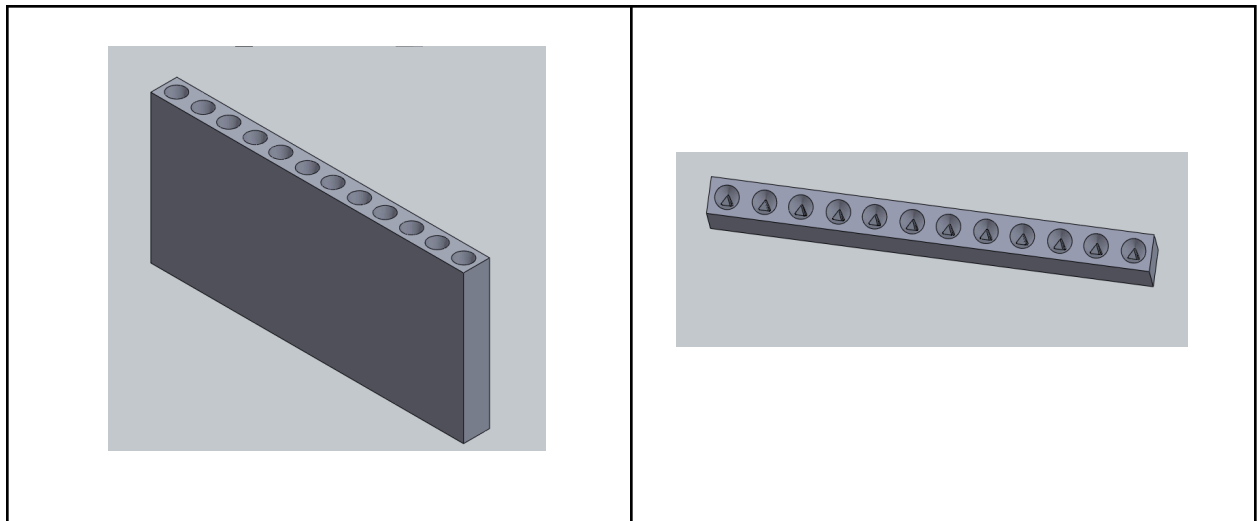
This week, our main focus was finding potential slicers for the device. We took multiple ideas and narrowed it down to a paper cutter and vegetable cutter mechanism. We will work on determining if these mechanisms would work to cut through 12 straws at once without cross contamination. We also reprinted the testing fixture for MTS testing, which will be next to execute. Additionally, we worked on changing our dimensions for the frame, stamper, and compartments to ensure that they are spaced out properly.

Difficulties / advice requests

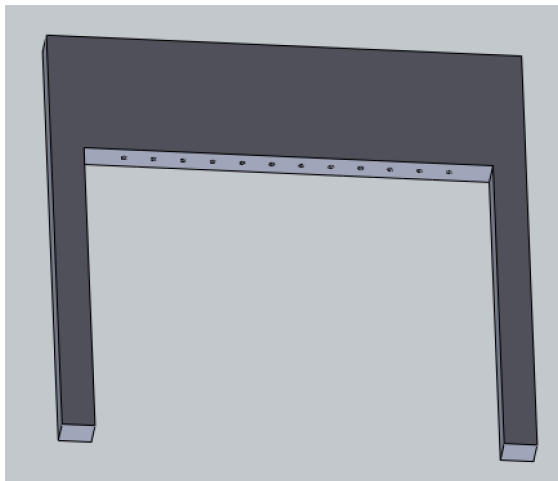
N/A

Current design

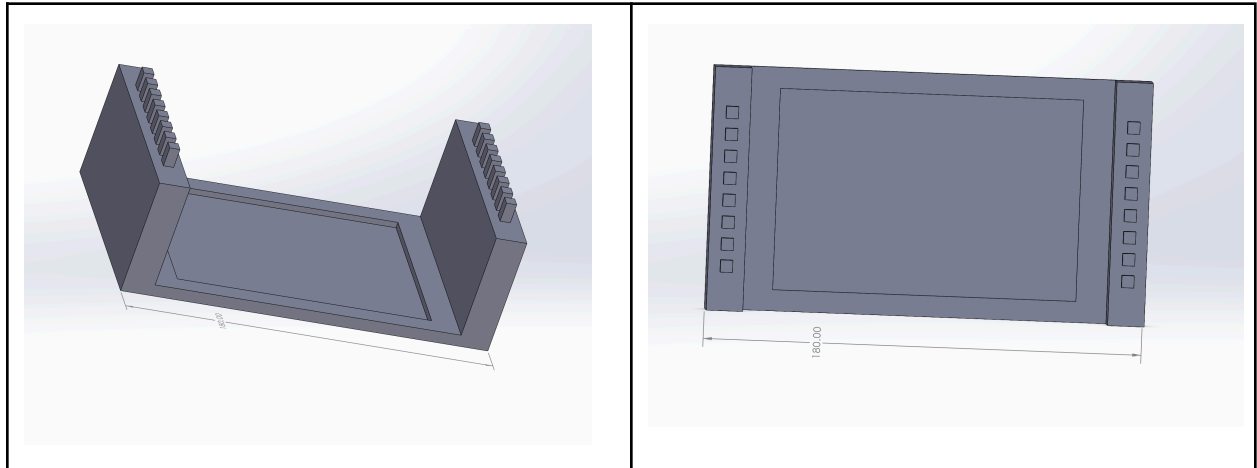
Compartments



Stamper



Well Plate Frame



Materials and expenses

Note:

- Allocated \$50.00 in payment account through UW-Madison to use at Makerspace
- Working with Makerspace to set up payment account if needed

Item	Description	Manufacturer	Mft Pt#	Vendor	Vend or 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 300mm)	Lyrilidr	-	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?
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

Major team goals for the next week

1. Use the new test fixture to perform MTS testing
2. Determine if the chosen slicer has enough force to cut through all 12 straws
3. Reprint stamper, frame, and compartments

Next week's individual goals

- Catie King
 - Perform MTS testing
 - Change stamper dimensions to align with compartments
 - Test slicer
- Lydia Miller
 - Perform MTS testing using modified testing fixture
 - Reprint stamper, frame, and compartments after finalizing dimensions
 - Test slicer tool
- Megan Lee
 - Dimension and add holes on the side of the compartments to align it with the well plate frame and stamper
 - Write protocol to perform MTS testing
- Janice Amornthanomchoke
 - Perform MTS testings
 - Perform cross contamination
 - Test new slicer device
 - Research other possible slicer in case
- Varenya Vegesna
 - Perform MTS testing
 - Perform cross contamination testing
 - Test slicer
- Emma Stroshane
 - Print out well plate frame to test with compartments and stamper
 - Test cutting straw with cutting board knife
 - Cut rods to desired length

Timeline

Week	Description	Status
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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	
11/17-11/21 Week 11	Weekly Team Meeting 12	
11/24-11/28 Week 12	Thanksgiving Break (11/27-11/30)	

12/01-12/05 Week 13	Final Presentation on 12/5	
12/8-12/12 Week 14	Final Deliverables due 12/10	

Previous week's goals and accomplishments

- Reprint frame, compartments, and testing fixture
- Perform MTS testing
- Perform contamination testing
- Utilize feedback from show and tell to inform future design

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Catie King	10/31-11/6	- Research slicers - Mapped out dimensions for well plate frame	1 0.5	1.5	24
Lydia Miller	10/31-11/6	- Modify test fixture design and reprint - Research slicers	1 1	2	26.5
Megan Lee	10/31-11/6	- Redimension compartments - Research slicers	0.5 1	1.5	27
Janice Amornthanomchoke	10/31-11/6	- Research slicers	1	1	21.5
Varenya Vegesna	10/31-11/6	- Research slicers - Update website	1 0.25	1.25	22
Emma Stroshane	10/31-11/6	- Fix dimensions for well plate frame - Research vibrating knives - Research ultrasonic cleaning efficiency	0.5 0.5 0.5	1.5	24.0