

Title: GVI: Straw Stamp and Slicer

Date: 10/16/2025

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.

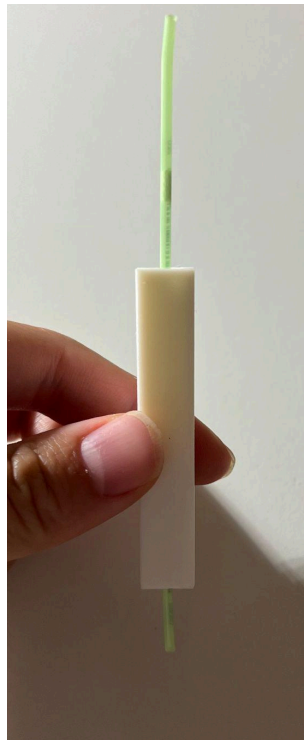
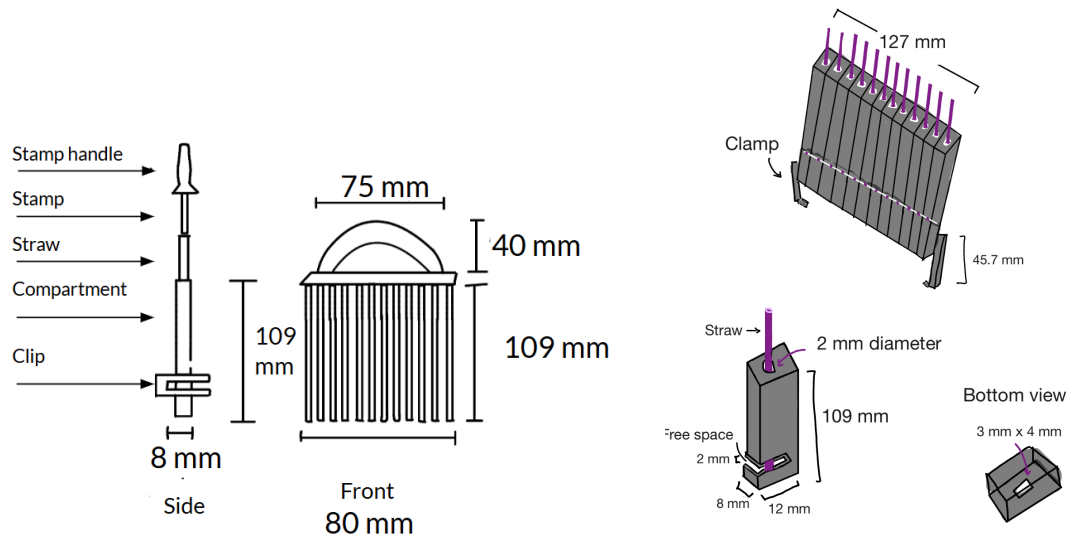
Brief status update

This week, we 3D printed different design iterations for the frame using ABS material. We also began to model the stamper, and was able to print the bottom component of it. Additionally, we ordered an aluminum rod to act as the prongs for the stamper.

Difficulties / advice requests

N/A

Current design



Materials and expenses

Current Budget:

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 2mm diameter single prototype	-	-	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 2.5mm and 3mm diameter single compartment prototype and stamper main piece with 1.5mm holes	-	-	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
									\$1.00	

Major team goals for the next week

1. Determine how to use UV fluorescents to test and quantify contamination
2. Print out stamper with handles
3. Figure out how to align the stamper with the frame

Next week's individual goals

- Catie King
 - Finish modeling stamper on SolidWorks
 - Print frame and ensure metal rods fit
 - Possibly look into other rod options (steel?)
 - Start contamination and force tests
- Lydia Miller
 - Troubleshoot errors with the stamper handle in order to reprint
 - Use information from meeting with Dr. P to plan contamination testing
 - Begin force testing
 - Design pieces to attach compartments to well plate
- Megan Lee
 - Test forces needed for the slicer and stamper
 - Figure out how to test for contamination

- Begin designing the frame for 12 straws and figure out how to connect the frame with the stamper
- Janice Amornthanomchoke
 - Continue fixing possible errors with devices
 - Continue testing frame for force and fitting the straw
 - Meet with Dr.P to learn how to use the fluorescent microscope and other ways to test for contamination
- Varenya Vegesna
 - Meet with Dr. P to learn more about fluorescent dyes and testing
 - Think about other forms of testing
- Emma Stroshane
 - Send email to Maggie about payment at Makerspace
 - Look into alternative rod options compared to aluminium
 - Have beads and dye ready to purchase if needed

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	
10/27-10/31 Week 8	Weekly Team Meeting 8	
	Show and Tell on 10/31	
11/03-11/07 Week 9	Weekly Team 9	
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

- Begin fabrication according to design plan consultation discussion
- Order necessary materials

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Catie King	10/10 - 10/16	- Started modeling another stamper design	1	1	17
Lydia Miller	10/10 - 10/16	- Design stamper (including piece that holds the rods as well as the handle) on SolidWorks	3	4	20

		- 3D print stamper	1		
Megan Lee	10/10 - 10/16	- 3D printed frame - Remodeled frame	2 0.5	2.5	20
Janice Amornthanomchoke	10/10 - 10/16	- Research methods for testing contamination - Download and learn how to use Solidworks	1 0.5	1.5	17
Varenya Vegesna	10/10 - 10/16	- Help decide on new dimensions - Research fluorescent dyes	0.5 1	1.5	15.5
Emma Stroshane	10/10 - 10/16	- Found possible material for rods in stamper - Updated finance charts - Began modeling possible bottom plate to keep well plate stable - Research ABS/PLA strength	0.5 0.5 0.5 0.5	2	17.5