Title: GVI: Straw Stamp and Slicer

Date: 10/9/2025

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.

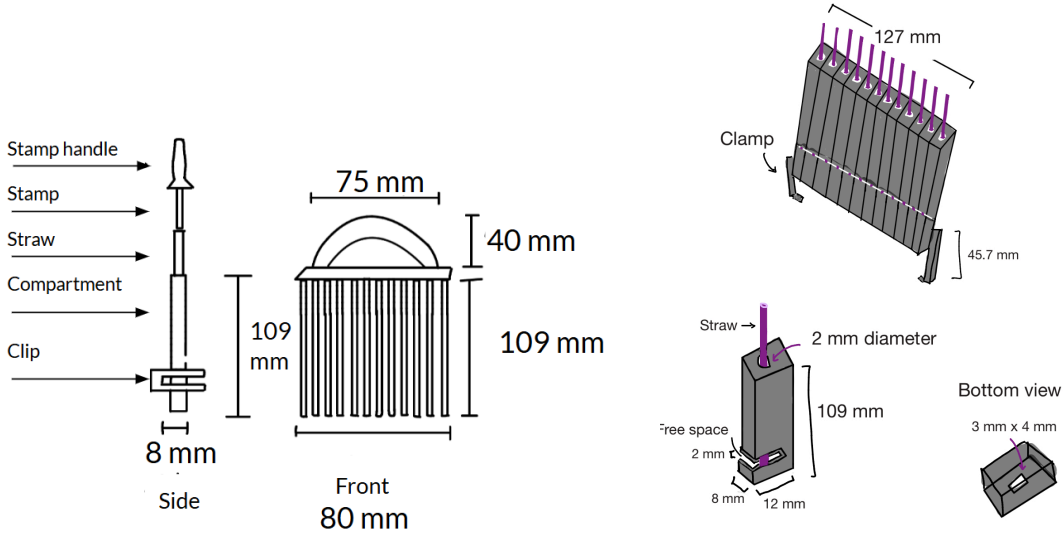
Brief status update

On 10/8, some of our group members met with a Makerspace staff member to get advice on how to enhance our current design and feedback for next steps in fabrication. The advice given was to change our frame opening into a funnel, which will taper into a triangle extrusion to help keep the straws in. Our next steps will be creating a prototype for the frame on CAD and 3D printing it with PLA and ABS, which we are hoping to finish by the end of the week. Our group also split up sections of the Preliminary Report, which was sent out on 10/8.

Difficulties / advice requests

N/A

Current design



Materials and expenses

Proposed Budget:

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Frame Materials										
ABS Filament	ABS 256mm/10 in Filament (Bambu Lab) FDM/FFF	-	-	Makerspace	-		150	$0.05	$7.50	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
Stamper Materials										
Steel Rod	Tight-Tolerance Corrosion-Resistant 316 Stainless Steel	McMaster-Carr	-	McMaster-Carr	2959N14		1	$48.31	$48.31	https://www.mcmaster.com/products/steel-rods/stainless-steel-1~/

PLA Filament	PLA 256mm/10 in Filament (Bambu Lab) FDM/FFF	-	-	Makerspace	-		70	$0.05	$3.50	https://docs.google.com/spreadsheets/d/125EWYr0aojDuu0BGfzzt-YhfGJA1wojkzE-Vt00tw_M/edit?gid=0#gid=0
								TOTAL:	**$59.31**	

Major team goals for the next week

1. Begin fabrication according to design plan consultation discussion
2. Order necessary materials

Next week's individual goals

- Catie King
  - Do more research on materials for 3D printing in makerspace
  - Work on SolidWorks to model stamper design and 3D print the base/handle
- Lydia Miller
  -
- Megan Lee
  - Start to design the frame on CAD and 3D print different iterations
  - Test forces needed for our device
- Janice Amornthanomchoke
  - Conduct research on the materials for the device
  - Start 3-D modeling the frame and testing out different versions of the device
  - Figure out a design for slicer device
- Varenya Vegesna
  - Work on design in solidworks
  - Research 3D printers
- Emma Stroshane
  - Work on determining final prices for materials needed
  - Resume work on the 3D SolidWorks design
  - Discuss with Makerspace ways to pay

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	
	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

- Deliver preliminary presentation and reflect on the feedback given
- Work on preliminary deliverables/report
- Discuss fabrication plans

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Catie King	10/3-10/9	- Conducted more research on specific sequencing techniques and danger of cross contamination - Worked on and reviewed preliminary report - Met with makerspace staff to discuss design ideas	1 2.5 0.5	4	16
Lydia Miller	10/3-10/9	- Research impacts of artificial insemination contamination to support preliminary report - Research other methods of testing cross-contamination - Wrote sections and reviewed preliminary report	1 1 2	4	16
Megan Lee	10/3-10/9	- Worked on Preliminary Report - Consultation meeting with Makerspace staff - SolidWorks designing	2 0.5 2	5.5	17.5
Janice Amornthanomchoke	10/3-10/9	- Worked on my section of the preliminary report and help revised it - Conducted research on the durability of 3-D printed materials - Attended BSAC meeting for the week	2 1 1	4	15.5

Varenya Vegesna	10/3-10/9	- Consultation meeting with Makerspace staff - Research materials - Worked on preliminary report	0.5 1.5 2	4	14
Emma Stroshane	10/3-10/9	- Created a finance table for frame and stamper parts - Began 3D modeling compartment - Research stainless steel pros and cons - Worked on Preliminary Report - Consultation meeting with Makerspace staff	1 0.5 0.5 2 0.5	4.5	15.5