Title: GVI: Straw Stamp and Slicer

Date: 10/23/2025

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

Catie King (Co-team leader) - cgking3@wisc.edu

Lydia Miller (Co-team leader) - lbmiller3@wisc.edu

Megan Lee (Communicator) - mjlee45@wisc.edu

Janice Amornthanomchoke (BSAC) - amornthanomc@wisc.edu

Varenya Vegesna (BWIG) - vvegesna@wisc.edu

Emma Stroshane (BPAG) - stroshane@wisc.edu

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

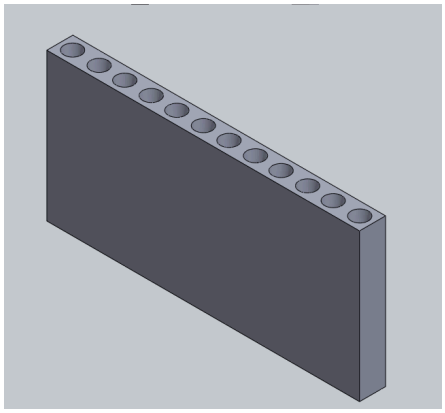
This week, we started to model our stamper and well plate holder on SolidWorks. We also created the frame for all 12 straws and printed it. Additionally, we are planning to meet with Dr. Puccinelli to determine how to test for contamination using fluorescent dye. We are also planning to do our mechanical testing this week to determine the forces needed to cut and stamp all 12 straws.

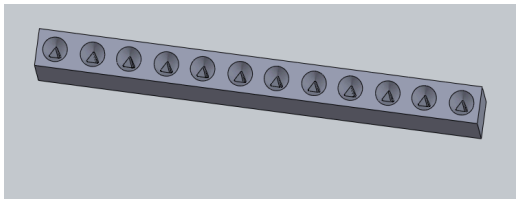
Difficulties / advice requests

N/A

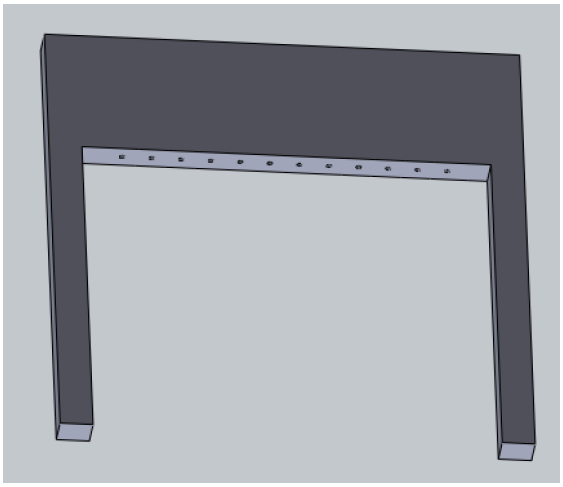
Current design

Compartments

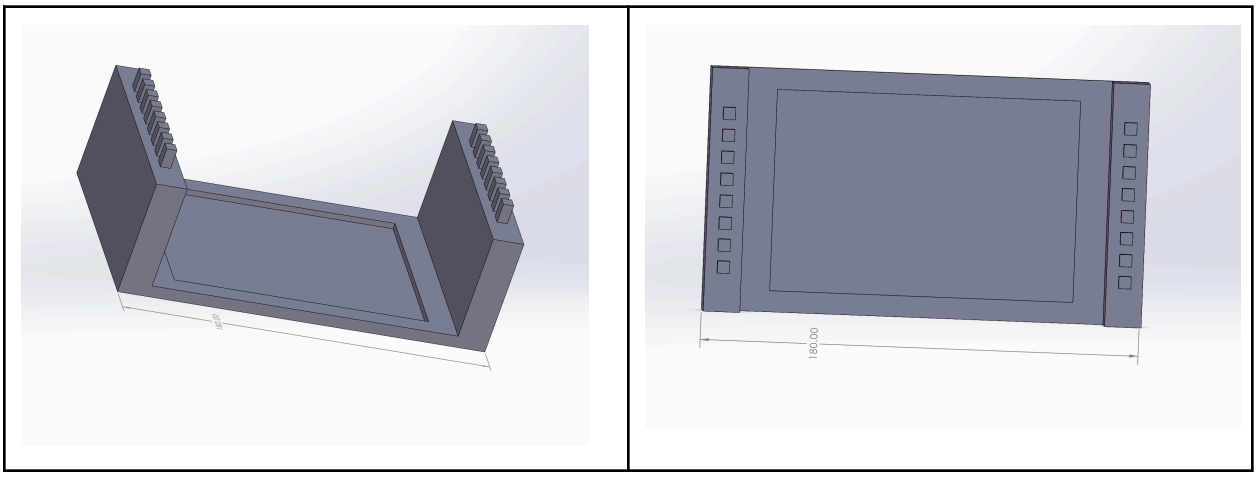




Stamper



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

Current Expenses:

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

Major team goals for the next week

1. Determine how to use UV fluorescents to test and quantify contamination
2. Print stamper, frame, and compartments with necessary attachments for alignment and cohesive devices
3. Begin MTS testing to determine forces to cut and stamp the straw

Next week's individual goals

- Catie King
    - Adjust dimensions of stamper based on plate frame and compartments dimensions so they all fit
    - Do some research on fluorescent and plate readers for contamination test
    - Write up a sanitation testing protocol
- Lydia Miller
    - Perform MTS testing to determine stamping force and slicing force
    - Come up with slicer idea
    - Begin contamination test using feedback from Dr. P
- Megan Lee
    - Add holes on the side of the frame for the stamper and well plate holder to slide into
    - Write protocol/do research for contamination test
    - Brainstorm slicer ideas
- Janice Amornthanomchoke
    - Do research on plate readers or flow cytometry for test contamination
    - Write protocols for testing force, contamination, and sanitation

- Varenya Vegesna
    - Write protocols for testing
    - Preform MTS testing
    - Begin contamination testing
- Emma Stroshane
    - Finish modeling and print well plate frame base
    - Update compartments 3D model to fit with base frame part
    - Look into payment account for client

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	
	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

- Determine how to use UV fluorescents to test and quantify contamination
- Print out stamper with handles
- Figure out how to align the stamper with the frame

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Catie King	10/17-10/23	- Modeled stamper in solidworks - Met with clients - Sanitation protocol brainstorming	1 0.5 0.5	2	19
Lydia Miller	10/17-10/23	- Met with team to create stamper design - Met with clients to discuss prototypes - Research on plate reader	1 .5 .5	2	22
Megan Lee	10/17-10/23	- Remodeled SolidWorks Frame drawing - Meet with clients	1.5 0.5	2	22

Janice Amornthanomchoke	10/17-10/23	- Research on flow cytometry - Design prototypes for frames on Solidworks - Met with clients and team	0.5 1 0.5	2	19
Varenya Vegesna	10/17-10/23	- Printed out updated frame - Research on sanitation methods - Updated website - Met with clients	0.5 1 0.25 0.5	2.25	17.75
Emma Stroshane	10/17-10/23	- Measured well plate and began updated dimensions for base - Meet with clients - Emailed Maggie about client payment Makerspace - Found possible steel rods	1.5 0.5 0.1 0.5	2.6	20.1