2022 JBS Summer Internship

JBS Greeley Beef – Greeley, CO

Gunnar Jessee

Introduction

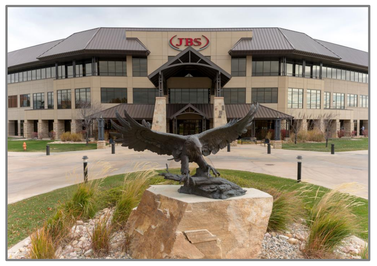
This summer I completed an internship with JBS at the Greeley Beef Plant in Greeley, CO. I worked 40+ hours a week, learning how the plant operates and gaining hands on experience on both the harvest floor and in the rendering department. My capstone project was to increase the amount of finished blood produced daily (lbs/Hd).

About JBS

JBS is the largest global beef producer with plants operating worldwide. I had the opportunity to work at the plant in Greeley, CO. On average, the Greeley Beef Plant harvests 5,000 head per day, operating Monday through Friday. JBS sells roughly half of it's beef domestically to many household names including McDonald's, Wendy's, Kroger, Publix, and Costco.

Typical daily production consists of:

- 5,000 head processed per day
- 385,000 lbs of offal
- 50,000 lbs of pet food
- 1,500,000 lbs of rendering
- 270,000 ft² raw hide



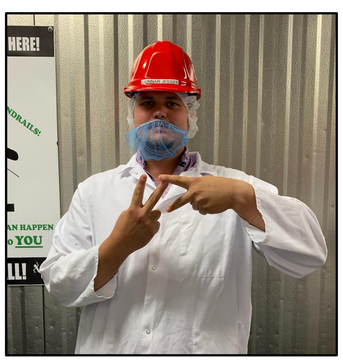
My Experience

I began my internship on May 23, 2022 and worked 40+ hour weeks for 10 weeks. Throughout my internship I was guided by two mentors, Co-Product Manager Jimmy Sias and Rendering Superintendent Enrique Estrada. They held weekly project progress meetings with me and helped to keep me on the right track as I worked through my project.

I was working the A shift, 6:00am – 2:30pm, throughout the entirety of my internship. The biggest challenge for me was adjusting to this environment, everything and everyone was moving at such a fast pace. For the first two weeks of my internship I was in shock to see so many people working so efficiently as they continued to harvest 5000 cattle day in day out.

This internship gave me the opportunity to visit the JBS USA corporate office on many occasions as well. They offered a weekly speaker series where the upper management of JBS would discuss personal experiences and tips to be successful in the business world. I enjoyed this speaker series as I was able attain valuable knowledge and wisdom from executives in a multi-billion dollar company.

While interning I had the opportunity to get hands on experience and learn the systems within the rendering department. I was able to assist in the loading of railcars and trucks, work directly on the raw blood harvest, and monitor the daily health of the equipment. I also became very familiar with carcass anatomy this summer as I was able to see every cut firsthand.



Capstone Project

My project was working on raw blood capture, with a goal of increasing the amount of finished blood produced (lbs/Hd). This project was important to the company because it showed opportunity to increase revenue ($/Hd), while also decreasing loading to wastewater.

I began by researching how much blood each carcass bleeds and found that on average between 4.2% and 5.7% of the animal's bodyweight is blood which equates to 44.75 lbs of obtainable blood per carcass. I then tested how much blood was being collected on the floor by bucket testing 30 carcasses individually as they came down the line and weighing what was caught.

Breed	Sex	Weight (lbs)	Blood Collected (lbs)	Bodyweight %
Angus	Steer	1443	27.5	1.9
Charolais	Steer	1390	33.6	2.4
Angus	Steer	1400	26.2	1.9
Hereford	Heifer	1340	22	1.6
Angus	Steer	1200	17.4	1.5
Angus	Heifer	1200	22.6	1.9
Angus	Steer	1414	21.4	1.5
Angus	Steer	1455	25.6	1.8
Angus	Steer	1455	31	2.1
Angus	Steer	1442	24.8	1.7
Angus	Heifer	1255	27.7	2.2
Angus	Heifer	1250	26.1	2
Angus	Steer	1202	29.4	2.4
Angus	Steer	1214	26	2.1
Angus	Steer	1214	27.5	2.2
Charolais	Steer	1195	28.9	2.4
Charolais	Heifer	1195	29.3	2.5
Angus	Heifer	1530	31.1	2
Angus	Steer	1410	31.4	2.2
Charolais	Heifer	1300	27.5	2.1
Angus	Heifer	1155	27.1	2.3
Angus	Heifer	1320	29.8	2.3
Hereford	Steer	1400	28.9	2.1
Angus	Steer	1490	28.4	2.7
Angus	Steer	1480	32.1	2.1
Angus	Heifer	1310	30.3	2.3
Angus	Heifer	1270	34.3	2.7
Angus	Steer	1540	40.1	2.3
Angus	Steer	1310	31.2	2.4
Angus	Heifer	1270	31.8	2.5

Avg. Weight	Avg. Blood Collected	Avg. Bodyweight %
1339.39	27.39	2.05

After realizing there was still opportunity to collect a lot of obtainable blood I began looking for areas along the line that could contribute to that loss. After thoroughly inspecting the line many times, my mentor and I decided to use the dentition station for my project. The dentition station is where the carcasses are aged via teeth to ensure they are not at risk for mad cow disease. As the carcass comes down the line the head is lifted by a stand to make dentition easier on the employee, the head lift also stimulates the carcass and causes blood to drain out overtop of the dentition station.

The major issue at hand with the dentition station was the blood drain is 6 feet off the line in an area that has little to no accidental blood dilution. Due to the drain being so far away and the inability to access that drain while carcasses are moving, all blood on the ground will coagulate and be swept to the drain on break where it is washed down the drain with a hose or the cover is lifted which allows foreign objects to enter the blood tank with the blood.

I collected data on 30 carcasses as they came down the line. I found that on average the head tilt captures 0.79 lbs of raw blood per carcass, 3,950 lbs of raw blood per day which is a loss of $0.10 per head. After coming off of the head tilt the carcass continues to bleed an additional 0.9 lbs which is a loss of an additional $0.11 per head. This is demonstrated in the tables on the right.

Head Stand	
1	0.55
2	0.55
3	0.65
4	0.9
5	0.6
6	1.05
7	0.8
8	0.5
9	1.05
10	0.5
11	0.65
12	0.7
13	0.45
14	0.6
15	0.85
16	0.75
17	0.8
18	1.25
19	0.85
20	1.05
21	1.15
22	0.75
23	0.95
24	0.6
25	1.1
26	0.9
27	0.7
28	0.65
29	0.75
30	1.1
Avg. =	0.7916667

Head Stand to Corner	
1	2.1
2	1.7
3	1.4
4	1.65
5	1.75
6	1.5
7	1.8
8	1.95
9	1.75
10	1.85
11	2.05
12	1.6
13	1.55
14	1.4
15	1.95
16	1.55
17	1.7
18	1.95
19	1.55
20	1.85
21	1.65
22	1.5
23	1.6
24	1.45
25	1.65
26	1.8
27	1.65
28	1.4
29	1.55
30	1.75
Avg. =	1.6866667

Project Results

After discussing the results from the dentition table with my mentors, we decided to talk with the plant engineer about starting blueprints to introduce a new blood drain to the dentition area. We came to the final decision of installing a new blood drain that is directly underneath the head tilt as well as extending the head tilt an additional six feet to allow for maximal bleeding. These changes are set to go into effect Winter of 2022 and will profit the company $124,800 annually.

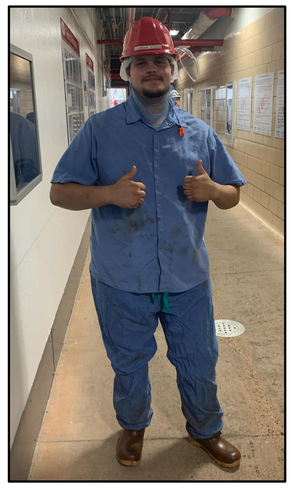
Dentition Table Final Results

- 0.79 lbs liquid blood
- 1lb/5lbs = 20% * .079 lbs = 0.16 lbs finished blood
- 0.16 lbs * $0.60 = $0.096 additional profit per carcass
- $0.096 * 1.3 million carcass' = $124,800 annually

Other Areas of Interest/Research

Stimulator

- Up to 10% of a carcass' blood remains in the muscles.
- 68.15 lbs * 10% = 6.82 lbs / 5lbs = 1.36 lbs finished blood per calf
- 1.36 lbs * 1.3 million = 1,768,000 lbs
- 1,768,000 * $0.60 = $1,060,800



Dentition Table to Back Puller

- 0.9 lbs liquid blood
- 0.9 lbs/5 lbs = 0.18 lbs finished blood
  - 0.18 lbs * $0.60 = $0.11 per carcass
  - $0.11 * 1.3 million = $143,000

Heads

- There is a lot of blood in this area, but due to the movement of the line, the amount of knives being used, as well as transporting the head from the line to a hook makes this an extremely difficult area to measure blood loss in.

Tail Puller

- There is always a large amount of coagulated blood in this area but it is behind a wall with many moving parts making it a very difficult area to measure blood loss in as well.

Conclusion

Throughout my internship I had the opportunity to network within one of the largest companies in the US while also having the opportunity to explore a side of the beef industry I was not familiar with. It was rewarding to be able to provide my input and have one of my ideas used by the company. This internship brought me great friends, a great learning experience, and memories that will last a lifetime!

Contact information

Feel free to contact me at gunnarj19@vt.edu with any questions about my internship or capstone project.