Radio Frequency Identification in the Beef Cattle Production Cycle at Livestock Services Inc.

A Senior Project

Presented to
Faculty of the Agriculture Education and Communication Department
California Polytechnic State University, San Luis Obispo

In Fulfillment for the Degree
Bachelors of Science

By

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Fall 2018

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Introduction
As time and technology has progressed, precision tracking has led many in the livestock industry to look into the next type of technology available to make their operations more efficient. This technology allows producers to individually track animals, with information ranging from weight, vaccinations used and pasture movements throughout the whole production cycle.

Applying Radio Frequency Identification (RFID) technology early in the production cycle can show that there is a higher accuracy in traceability that will decrease losses, and incorporate a better management style (Nääs, 2006).

Although this technology is in the initial testing stages in the multiple variations it is being used, most studies conducted have shown that when applied, this technology saves time and effort (Mutenje, 2015). Through this technology, producers would be able see what areas in the production cycle have the highest expenses and then be able to budget costs more efficiently.

Located in San Ardo, California, Livestock Services Inc. (LSI) has been in the beef production industry for over 60 years. With official regulations pushing for the use of RFID technology, LSI needs to evolve and adopt the use of this technology to better serve the industry, while continuing to produce high quality beef. This project will be a trial run to see if the in depth use of this type of technology leads to higher economic margins. The individual data attached to each cattle will then allow for better record keeping throughout the production process at LSI.

Background
As consumers are becoming more aware of how livestock production works, they are pushing for a better system to know where their food is coming from and how it is being produced (UC Davis, 2018). With the RFID technology, consumers would be able to access this information. A study from China goes through the initial process of researching what it would take to set up a universal system that could be implemented throughout the different stages of the production process (Liang, 2015). As this type of technology seems to be the future of the livestock production industry, many professionals want more research to be done and see if this is actually a viable option that would benefit them. In one of the studies conducted on opinions of implementing a mandatory RFID system, many producers said they would be willing to be a part this system if cost were kept to a minimum (Smith, 2009).

Throughout time, LSI has had to evolve to keep up with changing regulations, as well as to stay ahead of the competition. Being in a niche market of cattle importation from the Hawaiian island, LSI runs more than 4,000 head of cattle through its beef production feed yard per year. This means cattle are received from Hawaii and are then put through the production process with the end result being cattle ready for the final stage of beef production.

Methodology
First, the author evaluated the equipment needs for analyzing the herd. LSI already owned two RFID wands and utilized a data system that transfers to Microsoft Excel. New wands can be purchased through livestock suppliers for about $1,500 (Valley Vet, 2018). The RFID ear tags were ordered through LSI and used for this project.
To complete the analysis, the author was given permission to follow a select herd of cattle through the production process at LSI. As cattle are initially processed, they individually receive a RFID tag placed on their left ear. This tag was recorded in a computer data system, with the use of an Allflex RFID Wand, which stores information that was later uploaded to the data file. This collection of information will be assessed by LSI to improve the company’s allocation of expenses throughout the production process. By keeping a detailed usage report on individual medicines, accountants will better be able to keep track of and accordingly bill expenses. A selected herd was identified for this project and monitored using the wand twice within three months.

**Results**
Over the summer of 2018, a selected herd of 100 steers were followed through their production process while at Livestock Services Inc. Feedlot. This herd received their initial vaccination, brand, and proper ear tag identifiers, allowing for easy recognition of the test group being followed throughout the production process. A report was then started that detailed all the vaccinations and identifiers that the cattle received during their initial process, as well at what pen they would be located in throughout the production process for easy monitoring.

Throughout the following months, the selected cattle’s health was monitored, and results showed that out of the 100 steers being monitored, only six of the cattle were diagnosed and prescribed medicine. These dosages were noted, along with date of application to the individual cattle that received them, which allowed for better record keeping, allowing accountants to bill expenses accordingly.

**Discussion**
Keeping an extra eye on the selected group was a benefit to the cattle and the selected group remained in good health standings, with only 6% of the group needing to be provided medicine throughout the production process. The author determined that while the gathered information for 100 head was useful, the selected herd was too small of a sample size to analyze whether using RFID ear tags to monitor medicine administration increased economic margins throughout the selected herd production process.

It is recommended a larger herd, or all cattle under one owner, be followed for a determined amount of time. Those results will better determine if the expense of the RFID tags and data system are worth LSI’s investment. This could lead to a greater analysis of all cattle being purchased, allowing for a more in-depth report of medicine administered and health throughout the production process. Along with health monitoring, traceability back to the individual ranch they were purchased off of in Hawaii, LSI could further benefit by using this information for future analysis of cattle health. The author’s report to LSI following the 100 herd-size analysis, was received well. However, this analysis on this project did not give sufficient information on whether this type of program would fit in the budget.
References


