Economic Analysis of Trichomoniasis on New Mexico Ranches

Dr. Jerry Hawkes and Dr. John Wenzel

Introduction

Trichomoniasis is a sexually transmitted disease of cattle caused by the protozoa *Trichomonas foetus*. The disease is strictly a venereal disease that does not make bulls or cows outwardly sick. Trichomoniasis is primarily characterized by a loss of reproductive efficiency resulting in an increase in open cows, a decrease in percent weaned calf crop and a decrease in weaning weight. This loss of reproductive efficiency is due to the loss of pregnancy and the lengthening of the calving season. Bulls are a mechanical spreader during the breeding season. Infection is maintained in a herd by infected bulls and chronically infected cows called “carrier cows”. Trichomoniasis has a significant impact on the short and long term financial health of an operation when not properly managed. Losses for an operation may reach the point of requiring drastic change or ceasing operation due to insolvency.

Situation

A large ranch in New Mexico was modeled to demonstrate the economic impact of trichomoniasis (trich). Assumptions utilized for this representative beef cow operation are: 350 mother cows, 1 to 20 bull to cow ratio, 85% weaned calf crop and an annual cow culling rate of 15%. Calving season is spring and early summer with weaning and shipping in late October to early November. These parameters represent typical operations and values recognized across New Mexico ranches of this magnitude.

In this model scenario 1 assumes no impact of trich on the herd. The model was adjusted in scenario 2 to reflect early trich infection when first diagnosed with a decrease in percent calf crop of 10%, increase in culling of open cows by 10%, and a lengthening of the calving season which results in a decrease in weaning weights due to younger calves being shipped. The decreases in economic parameters are representative of changes that occurred in SW NM when ranches were diagnosed with trich. In scenario 3, changes reflecting a more chronic infection are demonstrated with a decrease of percent calf crop of 30%, increase in culling rate to 30% and a lengthened calving season. This decrease of 30% is representative of what was actually observed in New Mexico ranches when more chronically infected with trich.

Table 1 Model management parameters

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Mother Cows</th>
<th>Cow per Bull</th>
<th>Calf Crop %</th>
<th>Cow Cull Rate</th>
<th>Weaning Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>350</td>
<td>20</td>
<td>85</td>
<td>15</td>
<td>515/495</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>350</td>
<td>20</td>
<td>75</td>
<td>25</td>
<td>464/446</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>350</td>
<td>20</td>
<td>55</td>
<td>45</td>
<td>464/446</td>
</tr>
</tbody>
</table>
Cost and Return Estimate

A cost and return estimate provides a comprehensive look at the range livestock operation. This perspective considers many factors which are summed into categories that include, gross revenue, feed costs, and variable costs. Feed is a variable cost but for our example it is held separately only in presentation. Gross revenue is comprised of calf and cull sales of both cows and bulls. Feed costs represent; hay, protein supplements, leases, and salt and mineral. Variable costs consist of; veterinary costs, livestock hauling, hired labor, operating costs for machinery and vehicles, ranch maintenance, beef checkoff fees and purchased livestock. Table 2 represents the gross returns for each scenario, feed costs and variable costs.

Table 2 Gross returns, feed and variable costs for each scenario

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Gross Revenue</th>
<th>Feed Costs</th>
<th>Variable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario One</td>
<td>402.49</td>
<td>54.41</td>
<td>60.71</td>
</tr>
<tr>
<td>Scenario Two</td>
<td>312.09</td>
<td>55.29</td>
<td>77.01</td>
</tr>
<tr>
<td>Scenario Three</td>
<td>293.71</td>
<td>55.01</td>
<td>197.56</td>
</tr>
</tbody>
</table>

Management factors

The veterinary costs of testing bulls of $45 and other veterinary costs are assessed to each scenario. The cost of additional testing, feed costs of holding bulls while awaiting test results and increased labor costs associated with additional testing were assessed to scenarios 2 and 3. The decreased weaning weights seen in scenario 2 and 3 are present due to the lengthened calving season resulting in younger calves being marketed. Cull bulls and cows off of a premise where trich has been diagnosed may only be sold for slaughter. Therefore all culls in scenarios 2 and 3 receive slaughter pricing.

Scenario One

This scenario demonstrates the value of economic parameters when a trich infection has not been diagnosed. The expense of testing is included.

The results of a base operation were established on actual data\(^2\). Gross revenue per cow was $420 per cow. The total costs including both cash and non-cash were $330 per cow. Return above total costs per cow exceeded $72 per cow in the model herd that was not infected with trich.

Scenario Two

With the implementation of the production parameters in Table 1 which assume a 10% reduction in aggregate herd performance with early diagnosis of trichomoniasis the economic impact is significant. Gross return per cow is estimated to be $312 per cow. Total costs including both cash and non-cash are
almost $347 per cow. The return above total costs is a -$35 per cow. This value demonstrates that return above total costs dropped $107 per cow when trich infections yield a 10% reduction in herd performance.

The additional replacements needed to replace the 10% higher cull rate resulted in fewer heifer calves sold. This has an impact on both revenue and management costs needed for this strategy to be successful. In this scenario, economic impact would be substantial enough that long term sustainability would be questionable unless disease management changes were implemented.

Scenario Three

This representative ranch displays a 30% aggregate negative impact due to trichomoniasis infection on the operation. This level of infection results in devastating economic outcomes for the ranch. Gross returns fell to approximately $293 per cow while total costs exceeded $478 per cow. The result is a loss of almost $185 per cow. This value is almost a $275 negative return relative to scenario one.

It must be noted that with this level of impact a cull rate of 45% resulted in a situation where the ranch could not meet replacement needs through the base herd and is forced to obtain these animals from outside sources. Only one-third of the culled animals were replaced in year one. A three year plan was estimated for recovery to the operating level of 350 cows due to excessive cash flow requirements.

The lack of liquidity or solvency in this situation, unless otherwise addressed, will result in this operation being shut down. The economic devastation is too great to continue but can be corrected through time and intensive disease management and control.

Figure 1. Total costs and returns per scenario
Conclusion

Proactive management in identifying trichomoniasis in a beef cattle herd is essential to the long-term economic health of the ranch. Testing bulls for this disease is a relatively inexpensive insurance policy to warrant against possible economic complications. Without knowing the presence or absence of trichomoniasis, disease management decisions are not complete. Primary impacts that were displayed in this study include; calf crop losses, weaning weight losses and high livestock replacement costs. The combination of these factors proves to be economically devastating to the longevity of the herd and ranch.

Incidence of Trichomoniasis in New Mexico

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Tested</th>
<th>Positive</th>
<th>Negative</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>781</td>
<td>51</td>
<td>730</td>
<td>6.5</td>
</tr>
<tr>
<td>2006</td>
<td>4545</td>
<td>287</td>
<td>4258</td>
<td>6.3</td>
</tr>
<tr>
<td>2007</td>
<td>6685</td>
<td>137</td>
<td>6548</td>
<td>2.0</td>
</tr>
<tr>
<td>2008</td>
<td>7946</td>
<td>232</td>
<td>7714</td>
<td>2.3</td>
</tr>
</tbody>
</table>

References:
1. Data from Arenas Valley Animal Clinic Bayard, NM Dr. John C Wenzel
3. Data from Trichomoniasis testing at New Mexico Veterinary Diagnostic Services, Albuquerque, NM

Livestock Judging Team Update

By John W. Campbell

The livestock Judging team was in Albuquerque during the State Fair on September 12th and conducted a training session for the 4-H and FFA teams that will be representing New Mexico at the National Contests this fall. The team put together three classes for evaluation and then worked with the students with two sets of oral reasons. In addition, the team presented the youth judging members with a book of terms and sample reasons to help them prepare for the contests.

On September 17th the team was back in Albuquerque to participate in the Jerry Hawkins Memorial Judging Contest. Gwen Powers, along with the Junior College coaches, established the officials on the eight classes that were judged; the team also scored reasons for the seniors. There were over 200 youth and adults that participated in the contest. The team then traveled to Amarillo, TX and spent September 8th working out at West Texas A&M with their team and then participated in the Tri-State contest on September 19th.
The team conducted a judging contest at El Paso County Fair on September 26th and then another contest at the Southern New Mexico State Fair on October 3rd. There were 86 participants at the Southern Fair.

The Team competed in the State Fair of Texas Contest on October 5th in Dallas. They received the 5th place team award.

On October 24th, (Saturday of Homecoming) there will be an alumni judging contest starting with a light lunch after the parade. The contest is open to any alumni or spouse of an alumni or anyone that wishes they were an alumni; it will be held on campus. Please help us spread the word.

The team is in need of fundraising possibilities. If you have any ideas or can help me find donations for any of the judging teams, please give me a call (575-646-6180) or drop me an email at jwcamp@nmsu.edu.

NMSU CES Agent Professional Development Program – “A Day Addressing Forage Production and Management”

**DATE:** Tuesday, November 10, 2009

**LOCATION:** Bernalillo County 4-H Center, 1510 Menaul NW, Albuquerque

**REGISTRATION:** Free - Lunch will be on your own. In order to have sufficient training materials available, please email Dr. Turner at jltturner@nmsu.edu, to indicate that you will be attending the training by November 1, 2009.

**Program Coordinators/Presenters:** Dr. Mark Marsalis - Extension Agronomy Specialist, ASC—Clovis Dr. Francisco Contreras-Govea - Agronomist, ASC—Artesia, Mr. Leonard Lauriault - Forage Agronomist, ASC—Tucumcari, Dr. Jason Turner, Extension Horse Specialist, Las Cruces, NM.

**Program Overview:** This one day program will provide introductory training on forage management principles and common issues encountered by agents advising their local forage producers. There will also be a round table question and answer session to address individual situations. The program coordinators are seeking input from agents on what topics need to be addressed for an annual training on this subject matter.

**Program Schedule**

- **8:00-8:30 am** - Check in and refreshments
- **8:30-8:45 am** - Welcome & Program Overview
- **8:45-9:30 am** - Matching Forage Goals to Water Resources—Marsalis & Lauriault
9:30-10:15 am - Establishment/management of perennial forage species--Lauriault
10:15-10:30 am – Break - Q & A Session
10:30-11:00 am - Matching Forages to Horse Feeding Programs--Turner
11:00-11:45 am - Establishment/management of annual forage species—Marsalis

Noon-1 pm - LUNCH ON YOUR OWN

1:00-1:45 pm - Forages for Ruminants— Contreras-Govea
1:45-2:45 pm - Harvesting techniques and post-harvest management--Marsalis, Lauriault & Contreras-Govea
2:45-3:15 pm – Break - Discussion on topics for annual forage training course
3:15-3:45 pm - Round Table Q & A Session
3:45-4:00 pm - Program evaluation – Adjourn

ATTENTION ALL COUNTIES - 2010 REDBOOKS HAVE ARRIVED

The 2010 Red Books have arrived and will be ready for pick up at your earliest convenience. An email will be sent to all counties from Kathy Bustos for further information needed from our office, thank you.