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Cost Analysis for 2017 Wyoming Trichomonas Regulations

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1 Introduction

This paper is a preliminary Cost Analysis performed at the Wyoming State Veterinary Laboratory to fulfill an Agriculture Business research project. This project will cover the importance of the subject, results, and possible alternative scenarios. This paper is intended for WSVL use only and may not be transferable to other businesses.

1.1 Purpose

This Cost Analysis is in reference to the new 2017 Wyoming Trichomonas Regulations and addresses the effect these updates have had on samples received at the Wyoming State Veterinary Laboratory in Laramie, Wyoming. The WSVL would like to survey the results attained to evaluate the new policies and help detect any changes that need to be addressed. There are many surrounding state diagnostic laboratories that are in the same market region as the WSVL, leading to importance for the lab to stay competitive. This is an ongoing study to be completed at the end of spring semester 2018.

1.2 Background

*Trichomonas foetus* is a reportable disease-causing protozoan in the United States. Transmitted through sexual intercourse, this protozoan causes abortions in cattle. Cows often spontaneously clear the infection, while bulls are lifelong, asymptomatic carriers. As part of an eradication program all sexually active bulls are required by law to be tested prior to the act of selling. Before 2017 in Wyoming, either a culture or PCR test could be performed for the presence of *Trichomonas*. New regulations now require PCR diagnoses to take place.

1.3 Scope

This project covers data collected at the WSVL from 2012 through 2017. Both culture and PCR data were analyzed for 2012 to 2016. Individual veterinarians, producers, and faculty providing services were not included due to confidentiality guidelines. While prices of other competing diagnostic labs are discussed, the WSVL does not have access to trichomonas accessions from these labs.

1.4 Methodology

To conduct this analysis, data was provided by the WSVL. This included prices, number of tests each month from 2012 to 2017, and specific data on the top ten individual submitters. Data was split into pre- and post-regulation changes, and then divided further into four yearly quarters. Due to livestock sale trends, Trichomonas submissions are often seasonal. Splitting the data into three-month blocks helps to diminish the effect that these trends have on the results. Data
from 2012 to 2016 was then averaged to give a pre-regulation trend line. The 2017 data was compared to this line in order to determine if the new rules have had any effect on the number of samples received.

1.5 Evaluation Criteria

The main criteria for determining the cost or benefit due to new regulations are substantial decrease or increase in sample submissions, and change of seasonal trends. Analysis of changes in revenue is also included.
2 Assumptions, Constraints, and Conditions

2.1 Assumptions

The demographics, and size, of the target market are not changing at a substantial rate. Costs of testing have not increased dramatically over the past year. Prices of competing labs are held constant.

2.2 Constraints

All veterinarians sampling for *Trichomonas foetus* must be board certified in order for test results to be considered valid.

2.3 Conditions

Recently, there has been a drastic increase in the price of sample tubes due to a monopoly on the transit tube market. BioMed has produced a *Trichomonas foetus* transfer tube with a higher sensitivity.
3 Cost Analysis

3.1 Loss of Revenue

Currently, the only cost to the lab that is analyzed is the effect of omitting culture sampling on the number of samples received, and the consequent effect this has on revenues. Minimum and maximum numbers have been included for revenue, due to the decreased change in price of samples when submitted in larger quantities. Below are graphs depicting the numerical change in samples over time and the change in total revenue to the lab.
Pre-regulation Yearly Average Culture Compared to 2017
Samples Received at WSVL

PCR Samples Received at WSVL 2012-2016
Pre-regulation Yearly Average PCR Compared to 2017
Samples Received at WSVL

Number Samples Received

Seasonal Block

- 2012-2016 avg
- 2017

Total Samples Received at WSVL 2012-2016

Number of Samples

Seasonal Block

- 2012
- 2013
- 2014
- 2015
- 2016
### 3.2 Cost to Producers

These numbers are figured on a herd of ten bulls and an average vet visit cost of $260.

<table>
<thead>
<tr>
<th></th>
<th>Diamond’s Media</th>
<th>TFT Tubes</th>
<th>Culture</th>
<th>Kansas State TFT</th>
<th>Colorado State TFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies</td>
<td>60</td>
<td>100</td>
<td>4</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Vet Bill</td>
<td>260</td>
<td>260</td>
<td>260</td>
<td>260</td>
<td>260</td>
</tr>
<tr>
<td>Lab Bill</td>
<td>250</td>
<td>250</td>
<td>60</td>
<td>140</td>
<td>250</td>
</tr>
<tr>
<td>Additional Cost</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>580</strong></td>
<td><strong>620</strong></td>
<td><strong>334</strong></td>
<td><strong>520</strong></td>
<td><strong>630</strong></td>
</tr>
</tbody>
</table>
4  Description of Alternatives

4.1  Current System

Under the current regulations, the only acceptable sample method classified as official tests for *Trichonomaisis* is a PCR using BioMed’s TFT tubes.

4.2  Proposed System 1

The first alternative proposed is the use of Diamond’s media for PCR testing. Currently, many labs still allow this medium to be used for official tests and there are medical companies that produce Diamond’s. The idea behind this alternative is that producers will use the lowest cost method, causing BioMed to lose its monopoly and drop the TFT tube price. However, Diamond’s media is not as sensitive as BioMed’s TFT media, and more false negatives could occur. In turn, this counteracts the current eradication procedures that are taking place.

4.3  Proposed System 2

A second alternative is to lower the lab costs for PCR tests. This will make the WSVL more competitive among the labs and may increase the consumer pool. In order for this to happen, costs must be minimized at the lab to ensure there is no loss of profit. The WSVL already has a discount program for those who submit high numbers of samples, as well as a discount for pooling, but lower costs in general will help reach consumers with only one or two bulls.

4.4  Proposed System 3

The third option is to obtain the formula for the TFT tube medium and start in-house production. This is the least feasible idea, as the diagnostic lab does not have a current setup for production quality control. In addition, while no patent can be found on the formula of the medium, BioMed is not releasing this information.
5 Results of the Analysis

According to the data analyzed thus far, the Wyoming State Vet Lab is seeing a marked decrease in revenue stream after the implementation of the new *Trichomonas foetus* regulations. Even though the samples received experience a seasonal trend, the total number of samples is decreased during all four quarters. The overall PCR count has remained relatively similar, however, the inability to use culturing as an official diagnostic tool has led to an overall drop in numbers. There is a significant price difference in the consumer cost of culturing as compared to PCR, which may be a causative factor in the lack of customers switching test type.

Based on the results of this analysis, the current proposed system is to offer lower test costs at the lab. In order to keep the business efficient, the in-house costs must be cut first. This will keep the WSVL competitive in sales with other labs until the cost of the TFT tubes can be offset by another production business.
References


All data from the WSVL courtesy of Dr. William Laegreid