

# Assessing Trailer Cleanliness

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Proper washing and disinfection of swine transport trailers is an important step in maintaining biosecurity. Research projects have shown visual inspection of trailers is not a reliable assessment<sup>1</sup>. While traditional microbiological culture method can be used, they involve the use of plated media which need to be incubated and analyzed to obtain the level of contamination on the sampled surfaces. This approach can cause significant down-time for trailer operations and delays implementation of corrective actions while waiting for test results.

A rapid, easy to use and reliable way of monitoring surface cleanliness of swine transport trailers is needed for practical industry applications. ATP bioluminescence has been demonstrated to be a good alternative tool for monitoring surface cleanliness in swine transport trailers, providing results within minutes as opposed to days for traditional microbiological testing<sup>1</sup>.



In order to increase the speed of adoption of promising new technologies two demonstration sites were established (Quebec, Saskatchewan) to test the reliability and feasibility of ATP Bioluminescence in assessing trailer cleanliness.

The project was implemented in two different wash facilities where a minimum of 10 trailers were sampled on a weekly basis (over a 23 or 30 week period), representing 53% and 18% of the total number of trailers washed respectively, in Quebec and Saskatchewan. Both demonstration sites followed a similar protocol of cleaning, washing, disinfecting and drying, where drying included heated bays in the winter and trailers being placed outside during summer months (April-October). In addition, a minimum of two swabs were taken for each trailer ensuring an accurate representation of trailer cleanliness.

## What Did We Find Producer Experience?

As with any new technology proper implementation and training is key to ensure proper validation of the technology. In reviewing the results of both demonstration sites there are specific outcomes that can be categorized into advantages and disadvantages when using ATP Bioluminescence.

**Table 1.** Advantages and disadvantages of using ATP Bioluminescence

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Easy to implement</li> <li>• Easy to train staff regarding use of the equipment</li> <li>• Employees more engaged in the cleaning process. Curious to know how well they were doing.</li> <li>• Removing some of the subjectivity from the cleaning process. Creates an objective measurement.</li> <li>• Rapid assessment of trailer cleanliness - no significant down time for trailer.</li> <li>• Trailers that required additional cleaning were identified prior to leaving the wash area.</li> <li>• Meter is multi-purpose – could be used to assess cleanliness in other areas of the operation.</li> <li>• Builds due diligence and a quality control component in the washing procedure</li> <li>• Fewer rejected trailers – arrival at barns.</li> </ul>	<ul style="list-style-type: none"> <li>• One more step in the cleaning process/procedure. Sometimes gets lost in the daily routine.</li> <li>• Swabs need to be stored and handled correctly in order to ensure accuracy of meter reading results.</li> <li>• Swabbing could require entering the trailer after disinfection.</li> <li>• Small sample area, requires visual inspection.</li> <li>• Variance in meter readings related to potential environmental contamination – readings were higher if measurements were taken outside the wash/dry bay.</li> </ul>

## Continued Use of ATP Bioluminescence?

The jury is still out on continued use of ATP Bioluminescence. One demonstration site has made the decision to stop using ATP Bioluminescence in the clean, wash, dry and disinfect (CWDD) procedure largely based on variances experienced in the meter readings related to (potential) environmental contamination. Specifically it was difficult to establish whether the variation seen in meter readings related to an error in the CWDD procedure or to an external factor. This site will continue using third party visual inspection in combination with an annual training program with their employees to ensure quality control standards are met in the CWDD procedure.

The second demonstration site will continue to use ATP Bioluminescence perhaps even expanding its use within its internal truck wash facility. Both demonstration sites identified variances in meter readings related to (potential) environmental contamination, specifically when trailers were dried outside during summer months. They thought this could be addressed by adjusting the timing and increasing awareness related to sampling period and technique. They also felt it was an important step in the quality control process by removing some of the subjectivity in the CWDD procedure, in addition to creating more engaged employees. This site will continue to use ATP Bioluminescence combined with visual inspection as a method of maintaining quality control in the cleaning process.

## Economics

The economics of using ATP Bioluminescence will be specific to each situation based on the total number of trailers swabbed as a percentage of total trailers washed. Figure 1 outlines the potential range in costs associated with ATP Bioluminescence. The use of ATP Bioluminescence may benefit all trailers in the fleet regardless if they were swabbed or not, as swabbed trailers should provide a reliable benchmark of balance of the fleet. This analysis used in Figure 1 also assumes the ATP meter is paid for in 1 year, extending the payback period for the ATP meter would reduce overall cost per trailer sampled.

## Conclusion

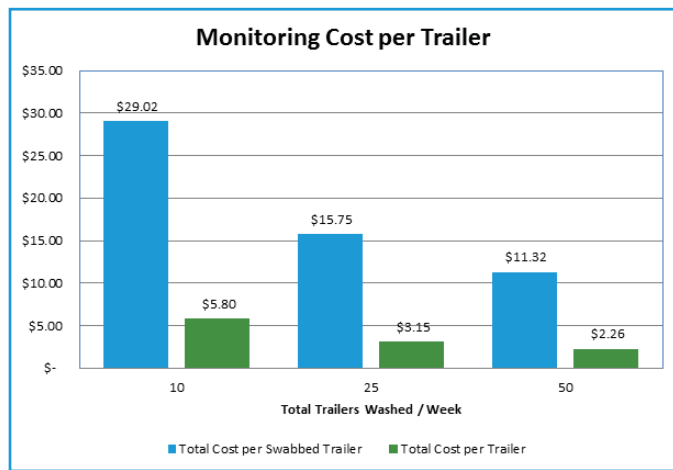
Research indicates ATP bioluminescence can be used as a supplementary tool for monitoring surface cleanliness of transport trailers in a rapid, simple, inexpensive and reliable way, to complement the CWDD procedures. However use of ATP Bioluminescence at demonstration sites

indicates there are several distinct advantages and disadvantages to commercial implementation. Each company or individual looking to include ATP Bioluminescence in their CWDD procedure will need to accurately assess: Why are we implementing this technology? Where will it be implemented? Are we committed to it? What is the expected outcome and what will we do with it?

## For Further Reading

<sup>1</sup> ATP Bioluminescence a Means for Assessing Trailer Cleanliness (English) <http://www.prairieswine.com/wp-content/uploads/2018/03/Trailer-Cleanliness.pdf>

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**Figure 1.** Economic analysis of incorporating ATP Bioluminescence in the trailer washing procedure. Calculations are based on 20% of total washes are swabbed using ATP Bioluminescence.

**Table 2.** Economics of ATP Bioluminescence Usage.

ATP Bioluminescence meter	\$2,300	
ATP testing swabs (100 swabs / box)	\$345	
	<b>Week</b>	<b>Year</b>
Total number of trailers washed	25	1,300
Total Number of trailers tested (20%)	5	260
Total Number of swabs (2 per trailer tested)	10	520
Total swab cost	\$34.50	\$1,794
<b>Total cost per swabbed trailer (\$4,904 / 260 trailers)</b>		<b>\$15.75</b>
<b>Total cost per trailer (\$4,904 / 1,300 trailers)</b>		<b>\$3.15</b>