



## Microbiological AD Evaluation at Tussen Mark en Amer Small Animal Clinic (TMA), Made, Netherlands (June/July 2011)

<p><b>Report Prepared by</b></p> <p><b>Name:</b> Bob Elen <b>Title:</b> Business Manager</p>  <p>27.1.12</p>	<p><b>Report Authorised by</b></p> <p><b>Name:</b> Abdel Ezbiri <b>Title:</b> Chief Scientific Officer</p>  <p>27/01/2012</p>
---	---

© Aerte Ltd. The contents of this report may not be abstracted, published or used for advertising without permission.

## Aerte Ltd

### Microbiological AD Evaluation at Tussen Mark en Amer Small Animal Clinic (TMA), Made, Netherlands (June/July 2011)

#### **Introduction & Objectives:**

Run in co-operation with TMA Small Animal Clinic near Made in the Netherlands, the objective of the evaluation was to assess the effect of the Inov8 Air Disinfection (AD) Unit on the environmental microbial load in a number of locations in the Clinic. These included two Operating Rooms (32m<sup>3</sup> and 27m<sup>3</sup>), a Preparation Room (78m<sup>3</sup>), Recovery Room (40m<sup>3</sup>) and a Dental Surgery (47m<sup>3</sup>). The rooms are shown in Appendix 1.

Air samples and contact plates were initially taken in each area without an AD installed. A total of 5 units were then installed and after a 5 week period further samples were taken for comparison.

The sampling was carried out by Aerte's Air Testing Division and the analysis of the samples carried out by MS Laboratories of Wellingborough, UK, an ISO17025 accredited laboratory. The analysis certificates are kept on file at Aerte Ltd.

#### **Sampling Protocol and Schedule:**

Air samples of 300 litres were taken using an 'IUL Spin Air' air sampler and pre-poured culture media plates of Tryptic Soy Agar (TSA) and Sabouraud Dextrose Agar with Chloramphenicol (SAB+C). Surface samples were taken using 'Rodac' plates with the same types of Agar. Two sample sets were taken at each location, yielding results for both bacteria and mould/fungus.

Samples were taken during the morning on each occasion in order to ensure consistency in the environmental conditions. A total of 5 locations were used for air testing and 9 for surface sampling, as indicated:

<b>Air:</b>	AS1: Surgery Room L: RH window shelf	<b>Surface:</b>	CP1: Surgery Room L: top of LH operating light
	AS2: Surgery Room R: RH window shelf		CP2: Surgery Room L: top of RH operating light
	AS3: Prep Room: worktop, LH end nr power socket		CP3: Surgery Room R: top of operating light
	AS4: Recovery Room: front right of cage		CP4: Surgery Room R: top of light box
	AS5: Dental Surgery: RH end of worktop w/- PC		CP5: Prep Room: front of towel dispenser C
			CP6: Prep Room: front of towel dispenser L
			CP7: Recovery Room: front of towel dispenser
			CP8: Dental Surgery: front of towel dispenser
			CP9: Dental Surgery: top of arm to imaging device

## Results:

The number of Air Samples totalled 70 for Total aerobic Bacteria Counts and 118 for Total Fungal Counts. 3 sample sets were taken before the ADs were installed and 4 after, and the results of the sampling exercise are shown in Appendix 2. Full statistical analysis is not possible because of the relatively low number of readings for each location, so these have been averaged in order to produce the graphical data shown.

Overall, the Air Samples show an average reduction of **36% in bacterial TVCs** (Total Viable Counts) and **24% in the fungal count**, and Surface samples show corresponding reductions of **51%** and **72%**.

To maximise consistency in the environmental conditions for each of the sampling periods samples were taken at fixed times of the day for each location, although there was some variation in the surgery areas as their use was unpredictable.

### Surgery Rooms:

In the two surgeries the initial 'without AD' samples were taken after a morning of relative inactivity in the Surgery Rooms, whereas those 'with AD' were taken immediately after operations had taken place. This could have led to a worsening of the perceived performance of the AD in reducing the biological contamination in the air but despite this **49% reduction in TVCs** and **29% reduction in fungus** was obtained. Average reductions in levels of surface contamination in this area are even **higher at 50% and 64%** respectively.

### Dental Surgery:

The results in the Dental Surgery showed little change in both airborne TVCs and fungal counts after the AD was installed. There were, however, significant levels of varied activity in this area both before and after the AD was installed and whilst samples were being taken. This unfortunately is the nature of the activity that takes place in the area, and this variability does not lend itself to consistent results being obtained when an air sampler is used. This is because in the relatively short period of time that the sampling is taken in, any variation in airborne levels will have a marked effect. The use of settle plates may well be a more effective method of sampling here: as they are exposed for a much longer period of time the short terms variations tend to be evened out, as is the case with surface sampling. In fact the latter point is proved by the significant reductions in *surface* TVCs of 68% and Fungal counts of 83% that were observed in the dental treatment area.

### Prep Room and Recovery Area:

The results in these areas showed good reductions in both TVCs and Fungus with airborne **bacteria reducing by 46%** and **fungus by 48%** in the prep room, and surface contamination **reducing by an average of 51% and 77%**. The Recovery area showed **reductions of 31% and 22% in airborne bacteria TVCs and fungus**, whilst the equivalent **surface reductions were 46% and 58%**. As has already been indicated, air sampling is very susceptible to activity levels and the recovery area is particularly prone to this because of the care required by animals recovering from operations.

## Conclusions:

Reductions in the levels of surface contamination proved significant for both TVCs and Fungi, with the reduction in levels of bacteria and fungus being as high as **58%** and **48%** for airborne TVCs and Moulds, and **82%** and **77%** for surface readings of TVCs and Moulds.

Overall, the presence of the Aerte Air Disinfection unit produced a significant reduction in the levels of contaminants on both surfaces and in the air. This in turn will reduce not only the risk of patients acquiring infections during surgical procedures and have a positive impact on their subsequent recovery, but also offer enhanced levels of protection for the staff and visitors.

R Elen

Business Manager, Scientific Support, Aerte Ltd

Email: [bob.elen@aerte.com](mailto:bob.elen@aerte.com)

Web: [www.aerte.com](http://www.aerte.com)

19 September 2011

## Appendix 1: Location Photographs



Fig 1: Surgery Room L



Fig 3 (i): Prep Room



Fig 2: Surgery Room R



Fig 3(ii): Prep Room

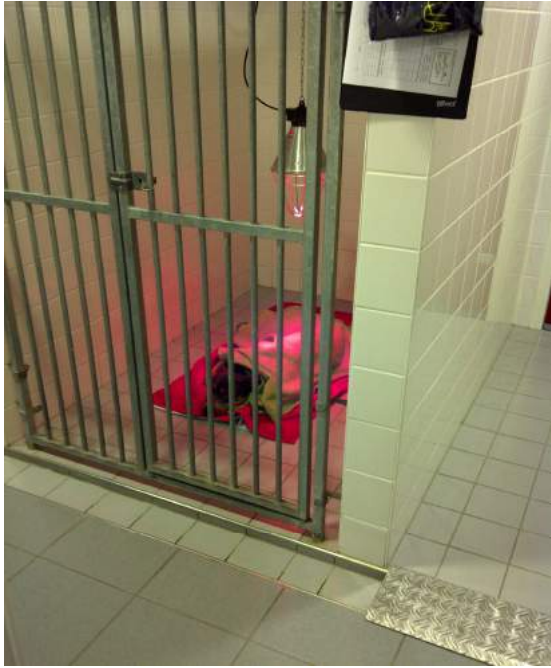


Fig 4(i): Recovery Room



Fig 4(ii): Recovery Room



Fig 5(i): Dental Surgery



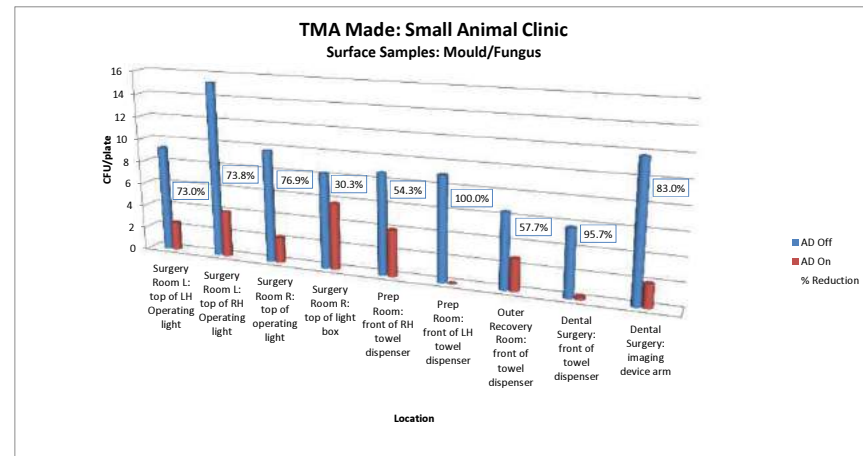
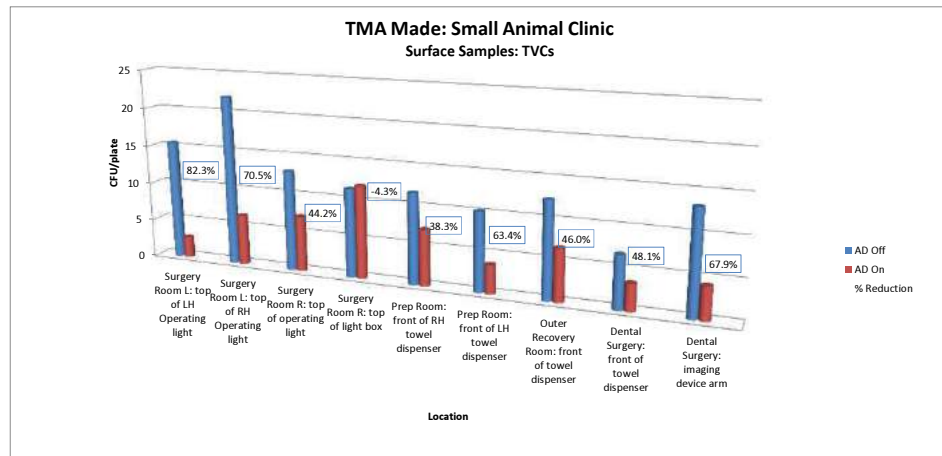
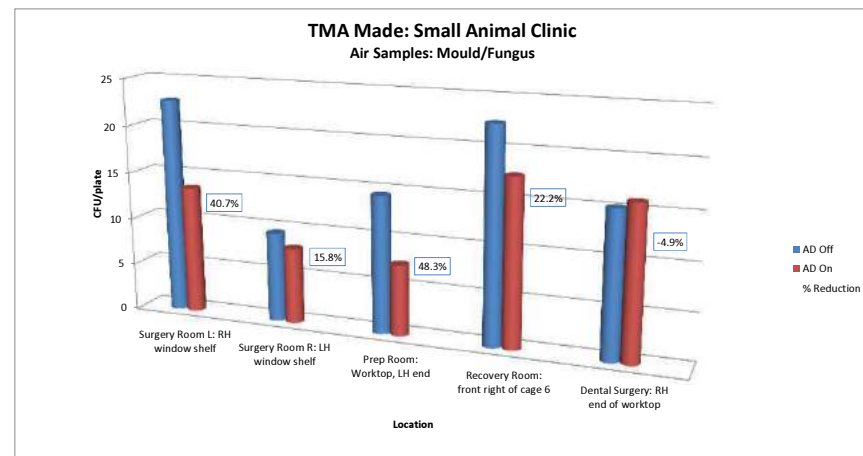
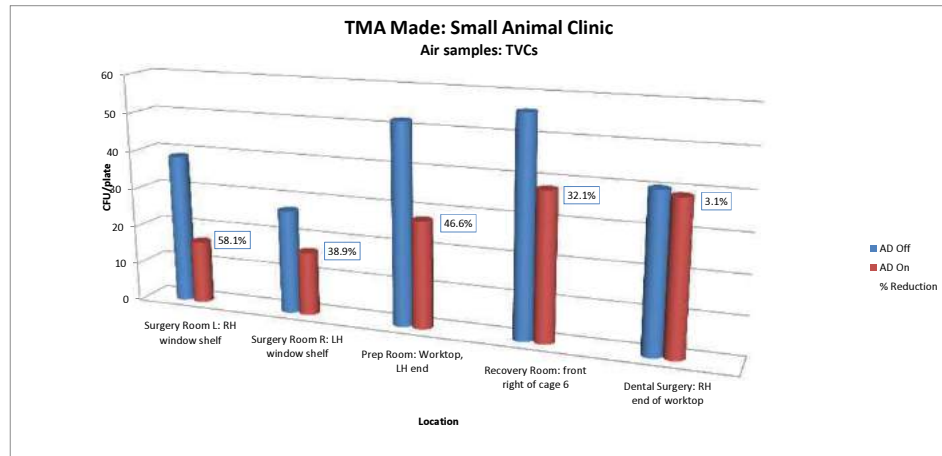
Fig 5(ii): Dental Surgery

**APPENDIX 2:**

**Aerte Ltd: TVC /Fungal Counts at Made Small Animal Clinic (Tussen Mark en Amer BV)**

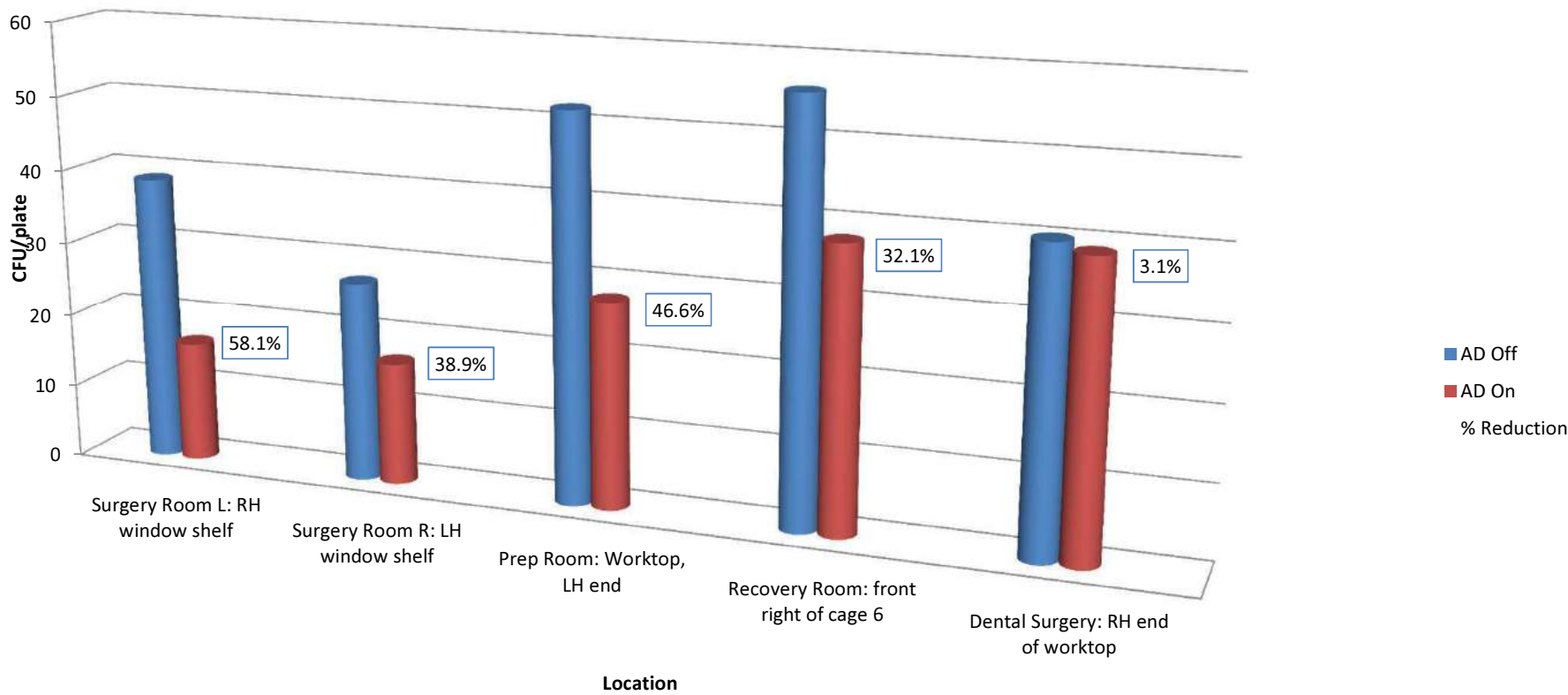
Finalised Data (Weighted Averages) for Graph:

Sample no:	Description	TVC		Mould/Yeast		Reduction %		Average Reduction %	
		No AD	AD	No AD	AD	TVC	Yeast/Mould	TVC	Yeast/Mould
AS1/7	Surgery Room L: RH window shelf	38.75	16.25	22.75	13.50	58.1%	40.7%	35.8%	24.4%
AS2/8	Surgery Room R: LH window shelf	27	16.50	9.5	8.00	38.9%	15.8%		
AS3/9	Prep Room: Worktop, LH end	52	27.75	14.5	7.50	46.6%	48.3%		
AS4/10	Recovery Room: front right of cage 6	56	38.00	22.5	17.50	32.1%	22.2%		
AS5/11	Dental Surgery: RH end of worktop	40.25	39.00	15.25	16.00	3.1%	-4.9%		
CP1/10	Surgery Room L: top of LH Operating light	15.5	2.75	9.25	2.50	82.3%	73.0%	50.7%	71.6%
CP2/11	Surgery Room L: top of RH Operating light	22	6.50	15.25	4.00	70.5%	73.8%		
CP3/12	Surgery Room R: top of operating light	13	7.25	9.75	2.25	44.2%	76.9%		
CP4/13	Surgery Room R: top of light box	11.5	12.00	8.25	5.75	-4.3%	30.3%		
CP5/14	Prep Room: front of RH towel dispenser	11.75	7.25	8.75	4.00	38.3%	54.3%		
CP6/15	Prep Room: front of LH towel dispenser	10.25	3.75	9	0.00	63.4%	100.0%		
CP7/16	Outer Recovery Room: front of towel dispenser	12.5	6.75	6.5	2.75	46.0%	57.7%		
CP8/17	Dental Surgery: front of towel dispenser	6.75	3.50	5.75	0.25	48.1%	95.7%		
CP9/18	Dental Surgery: imaging device arm	13.25	4.25	11.75	2.00	67.9%	83.0%		



# TMA Made: Small Animal Clinic

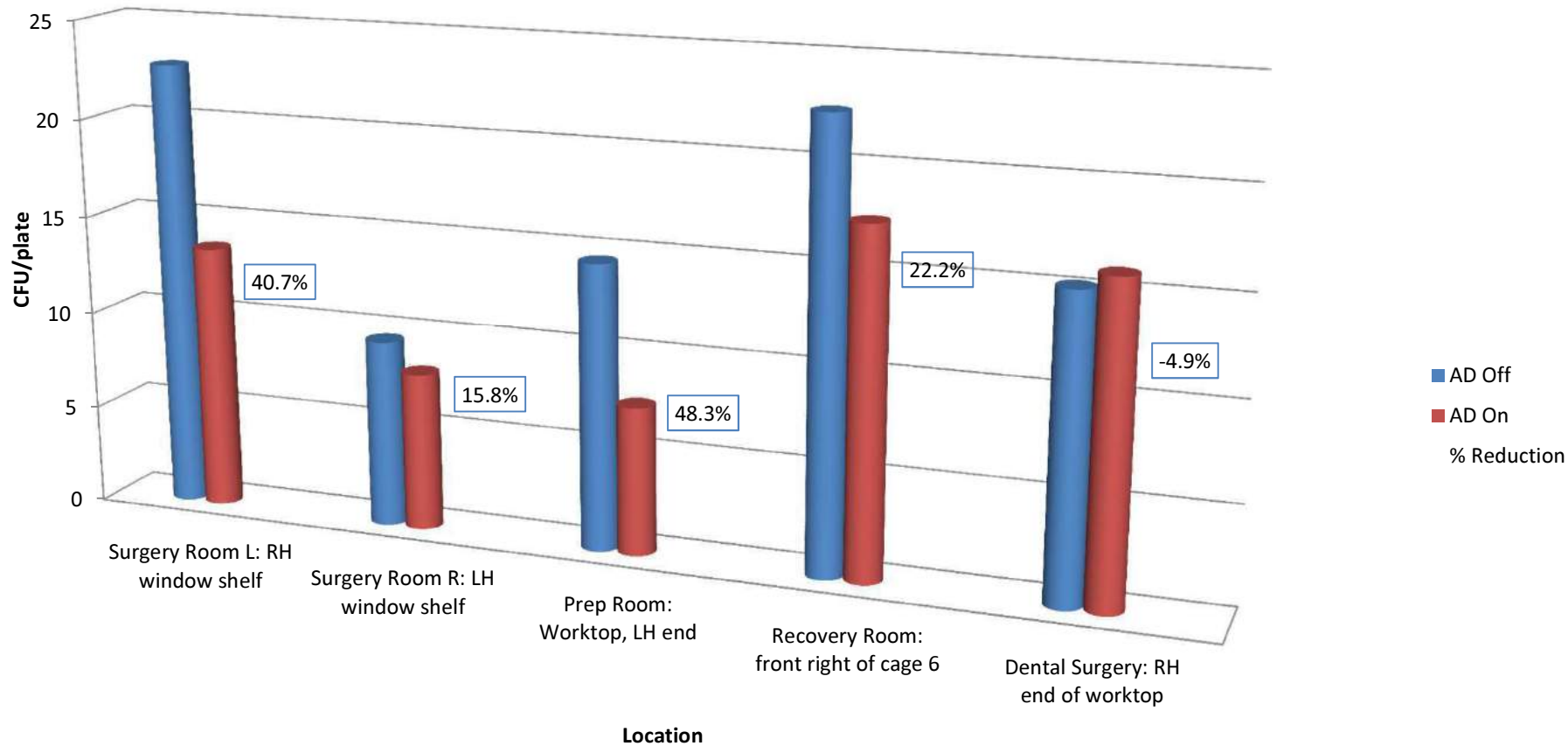
Air samples: TVCs



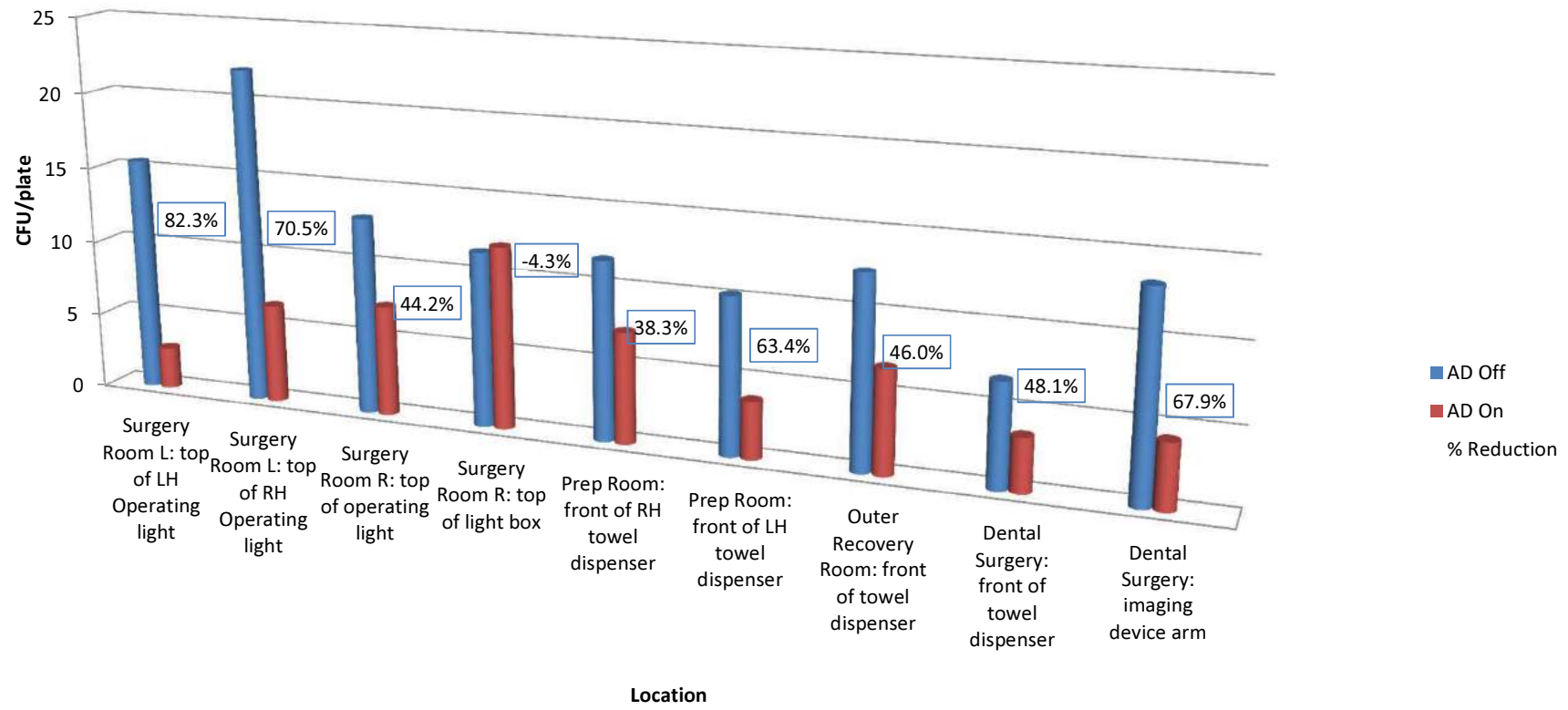


# TMA Made: Small Animal Clinic

## Air Samples: Mould/Fungus



### TMA Made: Small Animal Clinic Surface Samples: TVCs



## TMA Made: Small Animal Clinic

### Surface Samples: Mould/Fungus

