



Current Advances

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Providing Unique Technology for Animal Health

Analysis of *Streptococcus suis* serotype prevalence 2008-2009 Ontario and Western Canada

Gallant Custom Laboratories Inc. offers diagnostic services to swine practitioners specializing in respiratory, systemic, and enteric samples. Respiratory and systemic samples are screened for the presence of *Streptococcus suis*, *Haemophilus parasuis*, *Actinobacillus pleuropneumoniae*, *Actinobacillus suis*, *Pasteurella multocida*, and *Bordetella*. Recently, a compilation of the *Streptococcus suis* data from Ontario and Western Canada (Alberta, Saskatchewan and Manitoba) was initiated to determine the prevalent serotypes isolated and identified in our laboratory. Quebec and the Maritimes were excluded from this analysis because Gallant Labs do not routinely receive post mortem samples for evaluation from these areas.

The data was first analyzed to compare the prevalent *Streptococcus suis* serotypes from each geographical area and identify differences. It appears that there are 5 prevalent serotypes of *Streptococcus suis* in both Ontario and Western Canada- serotypes 1, 1/2 (cross reacts with types 1 and 2), 2, 3, and 6. In addition, we determined that there were also comparatively large numbers of untyped and autoagglutinating strains. In Ontario, the 5 prevalent serotypes, untyped and autoagglutinating isolates accounted for 64% of all the serotypes recorded. Whereas, in Western Canada the same 7 most prevalent serotypes accounted for 79% of the total serotypes found.

Most Prevalent Serotype	Ontario - All sites		West - All Sites	
	# of isolates	% of total Ontario isolates	# of Isolates	% of total West isolates
1	20	10%	14	12%
1/2	18	9%	14	12%
2	12	6%	16	15%
3	31	15%	5	4%
6	19	9%	10	9%
Untyped	17	8%	16	15%
Autoagglutinating	15	7%	14	12%
Other serotypes	74	36%	24	21%
Total	206	100%	113	100%

Table 1- Prevalence of *Streptococcus suis* isolates in Canada from Jan 2008 to December 2009 at Gallant Custom Laboratories Inc. diagnostic laboratory

In Ontario, the most common *Streptococcus suis* serotype was type 3 (at 15%) followed by types 1 (at 10%), types 6 and 1/2 (both at 9% each) and lastly type 2 (at 6%). The untyped and autoagglutinating strains accounted for 8% and 7% respectively- totaling 15% of all Ontario isolates. The profile is different in the Western provinces as the most prevalent *Streptococcus suis* serotype is type 2 (at 15%), with types 1 and 1/2 (both at 12% each), type 6 (at 9%) and lastly type 3 (at 4%). The untyped and autoagglutinating strains together accounted for a larger proportion at 15% and 12% respectively- totaling 27% of all Western isolates. Based on our data, *Streptococcus suis* serotype 3 is much more prevalent in Ontario than in Western Canada. Serotypes 1 and 1/2 proportionally have similar prevalence in both areas but type 2 is less common in Ontario than in the West. Serotype 6 is proportionally equal in prevalence in both areas. As a group, the 7 prevalent *Streptococcus suis* serotypes as a percentage of all serotypes detected, were found 28% of the time in heart samples and 16% of the time in lung samples. The classification of "other" refers to joint, liver, spleen or kidney and this accounted for 15% of the isolates. The lowest percentage was from the brain, but this could be partly due to the fewer brain samples (swabs) submitted. The most common sample submitted for *Streptococcus suis* isolation is a heart/lung pluck. 58% of the lung isolates, 64% of the heart isolates, 73% of the brain isolates and 67% of the "other" isolates were from the 7 most prevalent serotypes. Therefore in each of these organ sites the majority of isolates were the 7 most prevalent serotypes.

Caution must be exercised when evaluating location of serotypes since each case is restricted by the samples submitted and this places a selective bias in the data set. Therefore, the serotypes may also have been found in other organs if they had been submitted.

Serotype	Lung	Heart	Brain	Other	Total per serotype
1	8	4	2	6	20
1/2	4	8	3	3	18
2	2	6		4	12
3	8	17	2	4	31
6	4	8	1	6	19
Untyped	2	9	1	5	17
Autoagglutinating	4	6	2	3	15
7 most prevalent totals	32	58	11	31	132
Other serotypes	23	32	4	15	74
Total per organ site	55	90	15	46	206
7 most prevalent as a % of total in organ site	58%	64%	73%	67%	n/a
7 most prevalent as a total of all serotypes	16%	28%	5%	15%	64%

Table 2- Ontario *Streptococcus suis* prevalence based on organ site- number of isolates

Serotype	Lung	Heart	Brain	Other	Total per serotype
1	2	7		5	14
1/2	3	1	6	4	14
2	2	7	2	5	16
3	1	1		3	5
6	4	3		3	10
Untyped	2	5	1	8	16
Autoagglutinating	5	4		5	14
7 most prevalent Totals	19	28	9	33	89
Other serotypes	7	7	1	9	24
Total per organ site	26	35	10	42	113
7 most prevalent as a % of total in organ site	73%	80%	90%	79%	n/a
7 most prevalent as a total of all serotypes	17%	31%	9%	29%	79%

Table 3- Western provinces *Streptococcus suis* prevalence based on organ site- number of isolates

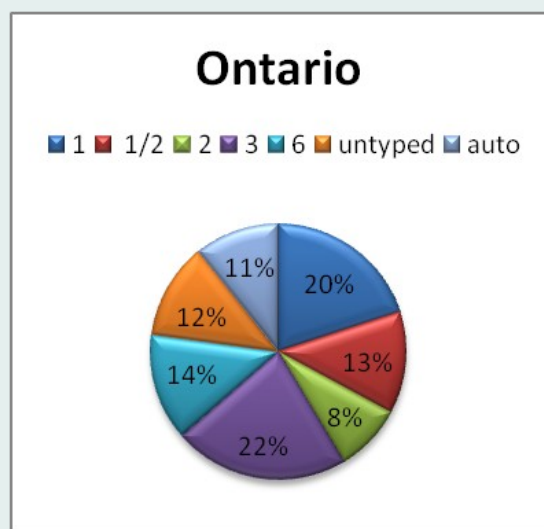


Figure 1—*Streptococcus suis* serotype prevalence in Ontario in 2008-2009

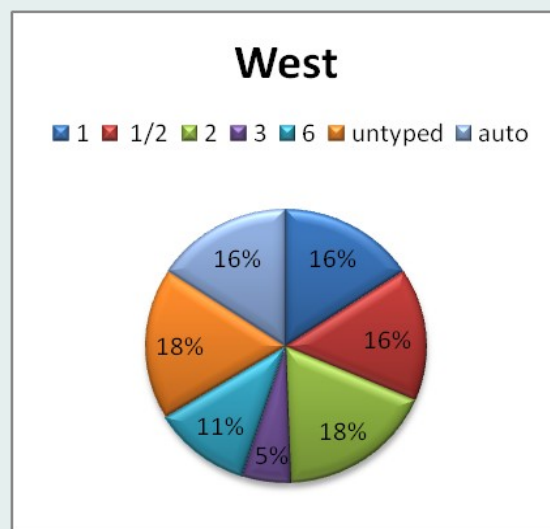


Figure 2—*Streptococcus suis* serotype prevalence in Western provinces 2008-2009

Based on organ sample type, the trend for detecting the prevalent serotypes was similar between the Western Canadian provinces and Ontario. 90% of the time Gallant found the 7 most prevalent serotypes in the brain, followed by the heart (80%) and "other" (79%) and lastly 73% in the lung.

It is clear that *Streptococcus suis* isolates can be found in several organs and the majority of the serotypes fall within 5 prevalent serotypes- 1, 1/2, 2, 3 and 6. In both the West and Ontario isolates that are not typed to serotypes 1 to 34 and that autoagglutinate in the antisera are just as common as the isolates that serotype.