Some Studies on Three Strains of *Streptococcus bovis* Isolated from Cattle and Sheep after Overfeeding with Wheat

Q. Shu[1,2], and A. Liu[1]

[1]Department of Animal Science, University of New England, Armidale NSW 23 5 1, Australia
[2]Cooperative Research Centre for the Cattle and Beef Industry, University of New England, Armidale NSW 235 1, Australia

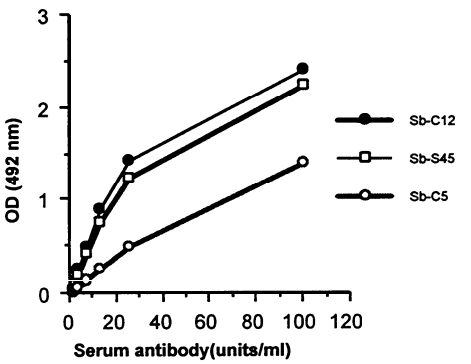
Three strains of streptococcus *bovis* were isolated from the ruminal contents of sheep and cattle: Sb-S45 from a sheep; Sb-C18 and Sb-C5 from different steers. All the strains were found in large number(more than 10^8 per ml) in the rumen fluid samples after the animals were overfed with wheat and the acute lactic acidosis occurred, but the strains presented only in small numbers ranging from 10^4 to 10^5 per ml before the animals being challenged with grain diets.

Antibiotic resistance analysis indicated that the MIC (minimum inhibition concentration) of virginiamycin to Sb-C5 was about 40 ug/ml *in* vitro, but the other two strains were much more sensitive to this antibiotic(table). This test was conducted by adding virginiamycin into the culture broth and making into different final concentrations, and then observed the growth of the strains in the virginiamycin containing broths. Some differences of substrate fermentation in the strains were also detected (Table 1).

ELISA analysis showed that Sb-C5 had less ability to bind with the antibody in the standard serum by coating the plates with the three strains(10^8 cells/ml),separately. The serum was obtained from the animals vaccinated by anti-S. *bovis* vaccine. When the antibody unit was 100(Serum dilution: 1:8000), the OD was 1.415 for Sb-C5, while the OD value was higher than 2.255 for the other two strains(Figure 1).

These results suggested that the antigenic property of Sb-C5 is markedly different from those of the other two strains.

Figure 1 Quantitative reaction in ELISA between the strains and the serum from cattle immunised with vaccine



References

De Herdt, P.,Haesebrouck, F., Devriese, L.A., and Ducatelle, R. 1992. Biochemical and antigenic properties of *Streptococcus bovis* isolated from pigeons. *Journal of Clinical Microbiology, 30: 2432-2434*

Kane, J.A. and Karakawa, W.W. 1969. Immunochemical studies on the cross-reactivity between *Streptococcus bovis,* strain S19, and Group A streptococcal carbohydrates. *The Journal of Immunology,* 102: 870-876

Table 1 Virginiamycin susceptibility and substrate fermentation of Sb-S45, Sb-C18 and Sb-C12

		S. bovis strain		
		Sb-S45	Sb-C18	Sb-C5
Virginiamycin(ug/ml)†	0	++++‡	++++	++++
	5	-	+	+++
	10	-	-	++
	20	-	-	+
	40			
Fermentation of	Starch	++++	++++	++++
	Glucose	+++	++++	++++
	Arabinose	-	-	+
	Esculin	++	+	-
	Mannitol	-	-	+
	Xylose			

†Virginiamycin was added into to the broths *in vitro* test;
‡"-" No growth observed; "+" ~ ++", Mild to middle growth, "+++~++++", High to extensive growth.