

71784 Condensed tannin concentration of two *Lespedeza* species and its effect on *in vitro* methane and total gas production



H.D. Naumann^{1,2}, L.O. Tedeschi¹, J.P. Muir², B.D. Lambert^{2,3}, D.K. Andrade-Silva⁴, and M.A. Fonseca⁵

¹Texas A&M University, College Station, TX, ²Texas AgriLife, Stephenville, TX, ³Tarleton State University, Stephenville, TX, ⁴Universidade Federal Rural de Pernambuco, Garanhuns, Pernambuco, Brazil, ⁵Universidade Federal Viçosa, Viçosa, Minas Gerais, Brazil



BACKGROUND

The US EPA has indicated that 21% of total anthropogenic CH₄ emissions in the U.S. are the result of enteric fermentation by domestic ruminants.

Previous studies have indicated that feeding forages containing biologically active condensed tannins (CT) suppresses the amount of CH₄ produced during rumen fermentation.

However, total gas production could also decrease, suggesting that organic matter digestibility is less.

EXPERIMENTAL OBJECTIVES

Compare *in vitro* total gas and CH₄ production between two warm season perennial herbaceous legumes known to contain CT.

MATERIALS AND METHODS

WARM SEASON PERENNIAL HERBACEOUS LEGUMES



CONDENSED TANNINS

Total condensed tannins were determined as described by Terrill et al. (1992) using species-specific standards for CT quantification.

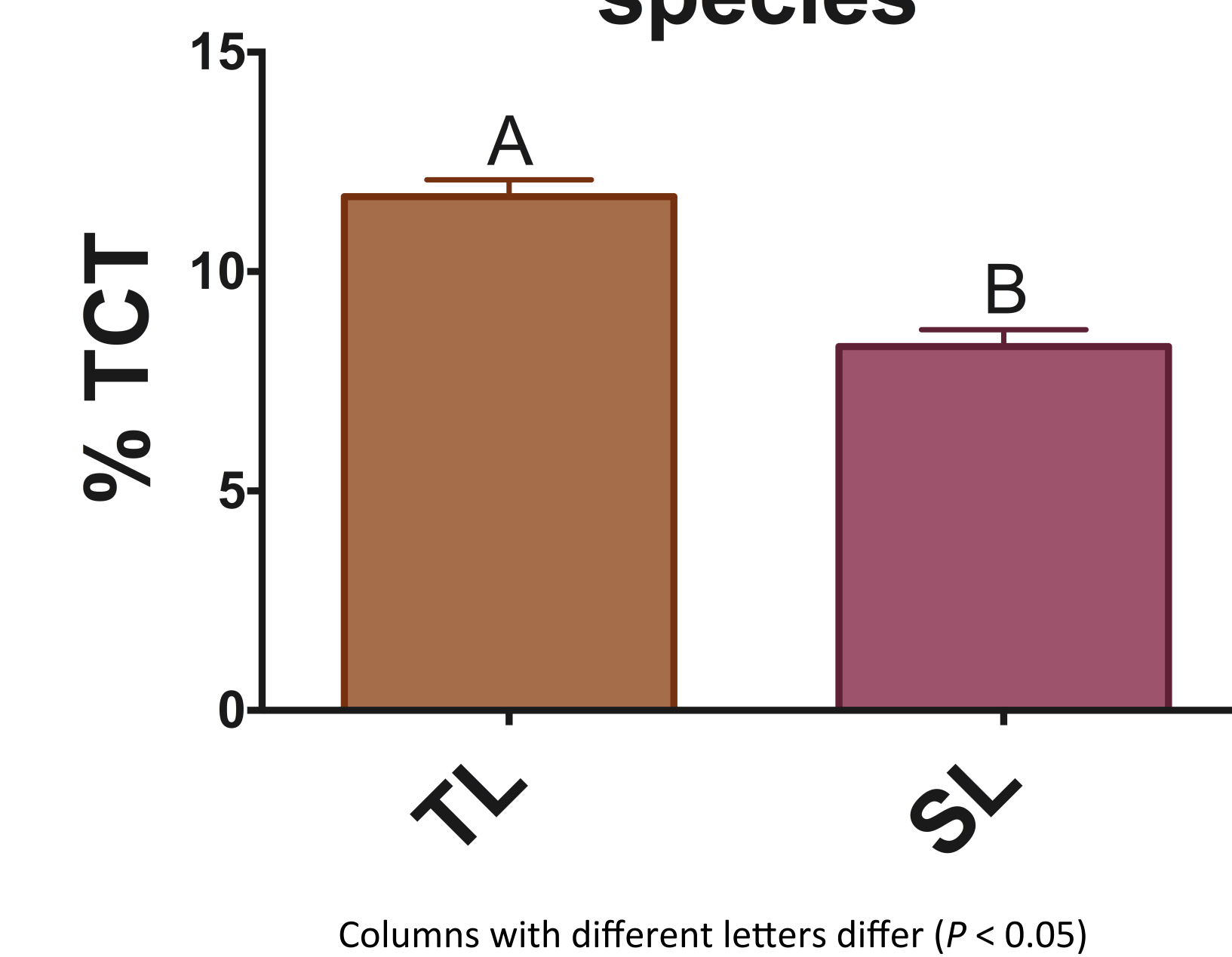
IN VITRO FERMENTATION

Methane and total gas production were determined using an *in vitro* gas production technique (Tedeschi et al., 2009).

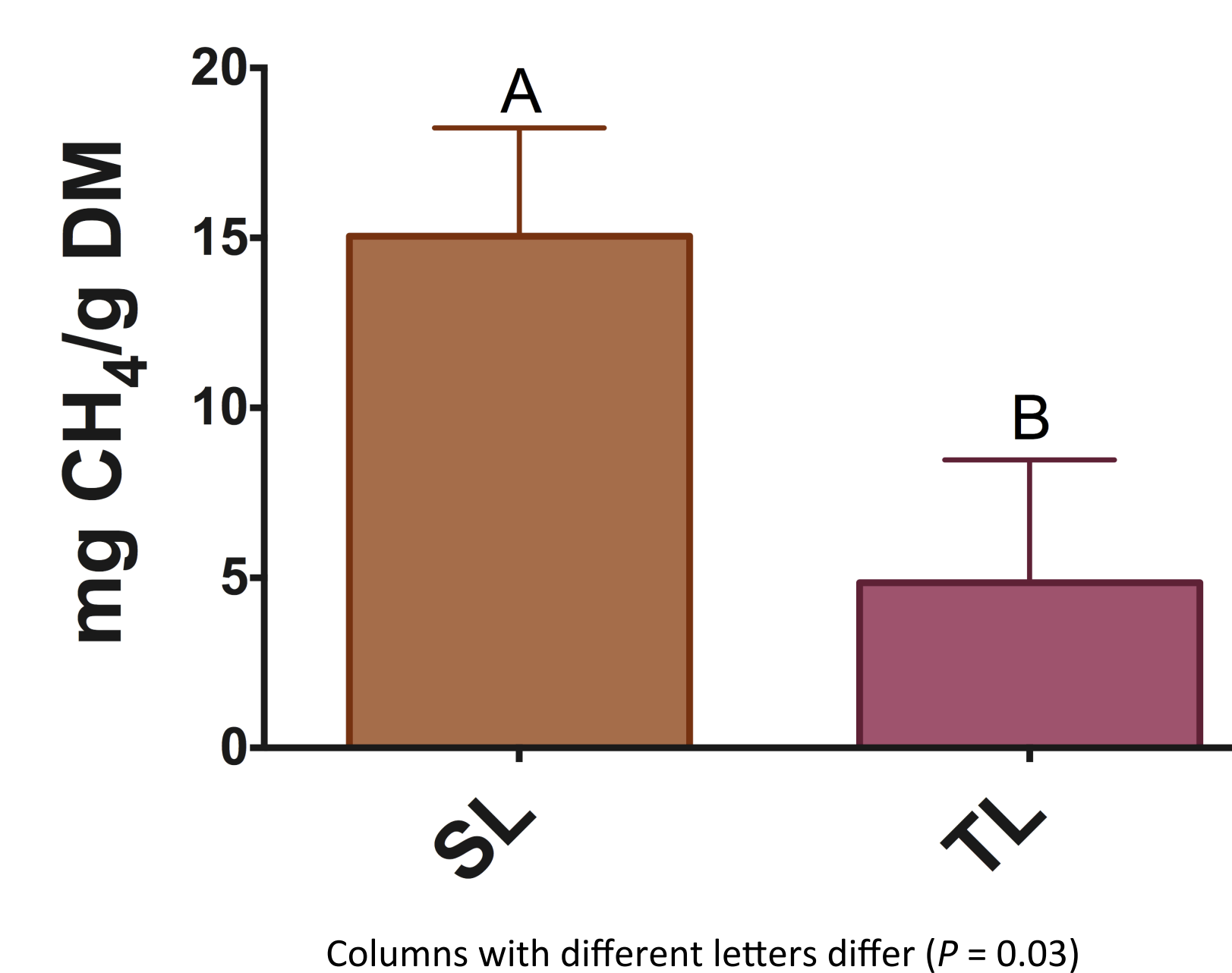
Forage (200 mg) was fermented for 48 hours in anaerobic conditions with rumen fluid collected from two steers consuming a diet free of CT.

RESULTS

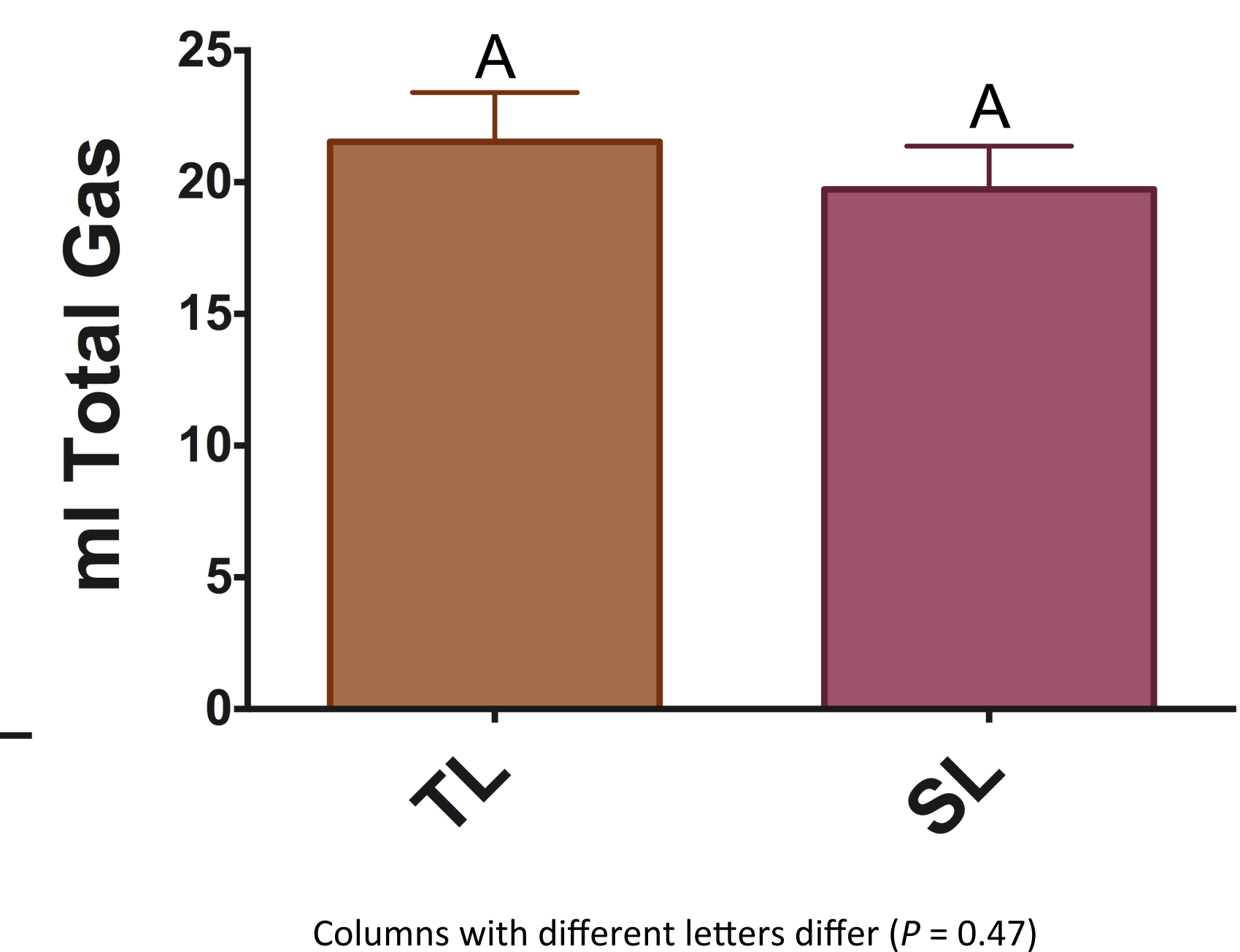
Condensed tannin concentrations of two *Lespedeza* species



Methane production by fermentation of two *Lespedeza* species



Total gas production by fermentation of two *Lespedeza* species



SUMMARY

- Tall lespedeza suppressed CH₄ production to a greater degree ($P = 0.03$) than sericea lespedeza *in vitro*.
- Total gas production was not negatively impacted by the greater TCT concentration of tall lespedeza.
- Tall lespedeza is a promising alternative to sericea lespedeza for suppression of CH₄ production while maintaining total gas production *in vitro*.

