



In vitro Gas Production Parameters of Sesame (*Sesamum indicum*) Stover Treated with Sodium Hydroxide and/or Urea

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Feed Resources

MINI ABSTRACT

Sesame stover, from Iranian plant varieties adapted to grow in semi-arid condition, was provided. Treatments were: untreated Sesame stover (SS), SS+urea, SS+NaOH and SS+NaOH+urea. *In vitro* gas production parameters of the samples were determined. Gas production was increased when sesame stover was treated with urea and/or NaOH. When samples were treated with NaOH, a greater increase in gas production from fermentable fraction was observed. However, gas production fractional rate (c) in SS (0.11 ± 0.01 , h^{-1}) was greater than the other samples.

Keywords: Sesame stover, gas production, urea, NaOH.

INTRODUCTION

Sesame stover is the most abundance residual of sesame cultivation in semi-arid regions of Iran, and traditionally used as a basal feed in sheep and goats nutrition. However, voluntary feed intake and total tract degradability of this stover are limited by its high complex-carbohydrate content and lignin. The feeding value of forage can often be improved with some additives such as urea and sodium hydroxide (Schingoethe *et al.*, 1980). Amount of gas produced from a feed is used as an index of its digestibility potential (Menke and Steingass, 1988). The aim of the present study was to evaluate the *in vitro* gas production parameters of sesame (*Sesamum indicum*) stover treated with NaOH and/or urea.

MATERIALS AND METHODS

Samples of sesame stover were obtained from Iranian plant varieties adapted to grow in semi-arid condition. Treatments were: untreated Sesame stover (SS), SS plus urea (SSU, 3 g/100 g DM, ensiled for one week at DM=50%), SS plus NaOH [SSN, 4 g/100 g DM of a NaOH solution (20% w/v) was sprayed on the stover and kept for 48 h] and SS plus both NaOH and urea [SSUN, NaOH (20% w/v) as 4 g/100 g DM was sprayed on the stover and kept for 48 h, then, urea (3 g/100 g DM) was added and ensiled for one week at DM=50%]. *In vitro* gas production parameters of the samples were determined using the Menke and Steingass (1988) procedure. Approximately 0.3 g of dried sample (n=3) was placed in a 100 ml glass syringes and then incubated into 40 ml of buffered rumen fluid (ratio of buffer to rumen fluid was 2:1), for 2, 4, 8, 12, 16, 24, 36, 48, 72 and 96 h. Rumen fluid was obtained from three sheep (49.5±2.5 kg) fitted by rumen fistulae,

before the morning feeding, and immediately strained through four layers of cheesecloth. The animals fed 1 kg d^{-1} of DM of lucerne hay and 0.3 kg d^{-1} of DM concentrates (165 g CP/kg of DM). The gas production data were fitted in a exponential equation of $P = b(1 - e^{-ct})$, where b is the gas production from quickly and slowly fermentable fraction, c is the fractional gas production rate ($/h$), t is the incubation time (h) and P is the potential of gas produced at time t.

RESULTS

The effects of NaOH and/or urea on *in vitro* gas production parameters (b and c) of sesame stover are shown in Table 1. Gas production was increased when sesame stover was treated with urea and/or NaOH. However, NaOH caused to greater increase in gas production from fermentable fraction. Fractional rate constant (c) of gas production in SS (0.11 ± 0.01 , h^{-1}) was greater than the other samples.

Table 1. *In vitro* gas production parameters of sesame stover (mean±SE) treated with NaOH and/or urea

Parameters	Treatment			
	SS	SSU	SSN	SSUN
b	40.85±0.64	46.89±0.5	61.5±0.6	61.0±1.0
c (h^{-1})	0.11±0.010	0.07±0.003	0.07±0.002	0.09±0.01

CONCLUSION

The *in vitro* gas production parameters of urea and/or NaOH treated sesame stover were greater compared with the untreated. The results of current study indicated that both urea and NaOH had a potential to enhance the stover digestibility as indicated by gas production under the present study condition.

REFERENCES

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