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Confection of SF₆ capsules used to estimate ruminal methane production in ruminants

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Introduction: In recent decades, the concentration of methane and other greenhouse gases that cause the global warming is increasing, associated with human population growth and related activities, involving the agricultural environment. One of the more notable activities is the production of beef cattle, which emit methane from fermentation in the rumen. The SF₆ tracer technique is used to measure these methane emission rates. This methodology requires care and depending on the preparation, may compromise the efficiency of lifetime and enteric methane collection from the animals. This study aimed to evaluate the effectiveness of the use of new and old materials to build the SF₆ capsules.

Material and Methods: The capsules were made and filled at Embrapa Southeast Livestock. 100 brass permeation capsules were filled with 1391 ± 62.39 mg of SF₆, according to the methodology described by Johnson et al. (2007). Of the 100 capsules, 25 were made with a new capsule and frit (NN), 25 with a new capsule and used frit (NU), 25 with an used capsule and frit (UU) and 25 with an used capsule and new frit (UN). All capsules were kept in an incubator at 39°C, simulating rumen conditions. The determination of the emission rates of the capsules was performed by gravimetric methods, weighed weekly for 107 days. Analytical scales were used with 0.0001g accuracy. The data were submitted to analysis of variance by the MIXED procedure using the SAS statistical software and multiple test averages applied for comparison of treatments.

Results and Conclusions: After filling all capsules, 3 had defects and lost the SF₆ gas, of these, two were UN and one was UU. The results are shown in Table 1.

Variable	Treatments*				Mean ± SD	P
	NN	NU	UN	UU		
Empty (mg)	27647 ^c	27733 ^c	27835 ^b	27971 ^a	27794 ± 17.71	<.0001
Filled (mg)	29059 ^c	29157 ^b	29210 ^b	29321 ^a	29185 ± 15.88	<.0001
SF ₆ (mg)	1411.9 ^{ab}	1424.3 ^a	1375.2 ^{bc}	1350 ^c	1391.1 ± 6.34	<.0001
Emission (mg/day)	3.212	3.173	3.427	3.006	3.202 ± 0.06	0.1102
Lifetime (months)	12.8 ^{ab}	13.5 ^a	11.8 ^b	13.0 ^{ab}	12.8 ± 0.22	0.0395

a, b, c Different letters in the same row differ (p < 0.05) by the Tukey test.

*NN: new capsule and frit, NU: new capsule and used frit, UN: used capsule and new frit, UU: used capsule and frit.

There were no differences observed in SF₆ emission using used and new materials. The differences observed in the capsule lifetime were related to the SF₆ load.

References:

JOHNSON, K. A.; WESTBERG, H. H.; MICHAL, J. J.; COSSALMAN, M. W. The SF₆ technique: methane measurement from ruminants, *In: Makkar, H.P.S, Vercoe, P.E (Eds.), Measuring methane production from ruminants*, Springer, Dordrech, Netherlands, 2007. p. 33-67.