

Can we use the methodology of silage dry matter content correction defined in Europe with the samples drying methods used in Brazil?

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Introduction The first step for chemical evaluation is the feed drying in forced air oven. Then, to determine the feed dry matter (DM) content, after grinding the sample in a mill, a second drying is done at 105°C to evaporate remaining water. However, for silage samples, part of the fermentation products can be lost by volatilization, so, the correction of DM content is required to obtain proper water content. According to Weissbach and Strubelt (2008 a,b), it is possible to correct this variable in maize and grass samples, using an equation that includes the fermentation products concentrations, if the forage processing consists of preliminary drying at 60 to 65 °C, with a second drying for three hours at 105 °C. However, in Brazil, the most common DM content evaluation is described by Detmann et al. (2012), which consists in drying in a forced ventilation oven at 55 to 60 °C for 24 to 72, followed by a second drying in an oven at 105°C for 16 h. So, the goal was to verify if these different methodologies for DM content measurement provides similar results.

Methodology The field experiment was carried out at Embrapa Agrossilvipastoril, while the chemical analyses were performed at the Forage Laboratory of the Federal University of Mato Grosso, Sinop-MT *campus*. A completely randomized design with five replications was used. The treatments corresponded to a 5x2 factorial, with two DM content methods and five forages. The methods for DM evaluation were: Dettman et al. (2012), where 300 g of silage sample in paper bag was put in a forced ventilation oven at 55 °C for 72 h (preliminary drying), with a second drying in an oven at 105 °C for 16 h, and Weissbach and Strubelt (2008 a,b), where 100 g of silage sample in aluminium tray was put in a forced ventilation oven at 60 °C for 18 h (preliminary drying), with a second drying at 105 °C for 3 h. The forages were fresh maize cv. 2B 810 PW (DowAgroscience), and fresh or wilted elephant grass cv. Capiaçú [*Pennisetum purpureum* Schum cv. BRS Capiaçú] and Zuri guinea grass [*Panicum maximum* Jacq. cv. BRS Zuri]. The grasses were harvested (at ground level and at 0,3 m above ground when with 2,0 and 1,0 m high, for Capiaçú and Zuri grass, respectively) and ensiled in January 2018, and maize (dent stage) in May 2018. The Zuri and Capiaçú samples were immediately chopped (1-cm particle size) or wilted for 1 h and subsequently chopped. Experimental units consisted of mini-silos (2.75 L), which were closed for 91 days. After silos opening, silage samples were placed in forced ventilated oven, according to the methods of DM content, for pre-drying. Subsequently, the samples were ground in a stationary mill with 1 mm sieve. After grinding, the second drying was done according to the methods of DM content. Definitive DM was obtained by multiplying the values of preliminary and second drying. Data were submitted to the analysis of variance and the averages compared by the LSD test (P<0.05).

Results and discussion Effect of forage was observed for all variables ($P < 0.001$). The methods did not affect the DM content in the preliminary drying ($p = 0.185$), nor the definitive DM content ($p = 0.917$). However, the DM content differed ($P < 0.001$) in the second drying. The high proportion of grains promotes higher DM content for maize, while higher stem proportion provides lower DM content for elephant grass, and wilting increase DM content for grasses. For second drying, higher value of DM content was observed for the method by Dettman et al. (2012), possibly because of the paper bag use for preliminary drying in this method. The absence of difference between the methods for definitive DM content possibly allows the use of the equation defined by Weissbach and Strubelt (2008 a,b) to correct DM content in silages, even if the sample drying is performed using the method described by Dettman et al. (2012).

Table 1. Silage dry matter content ($\text{g } 100 \text{ g}^{-1}$) of elephant grass cv. Capiaçú and Zuri guinea grass, fresh and wilted, and maize submitted to evaluation methodologies. Sinop-Brazil. 2018.

Methodology	Elephant grass		Zuri guinea grass		Maize	Mean	CV (%)
	Fresh	Wilted	Fresh	Wilted			
Preliminary drying							
Dettman et al. (2012)	17.61	21.08	25.69	31.92	34.91	26.24 A	3.49
Weissbach and Strubelt (2008)	17.77	20.74	24.93	31.37	34.67	25.89 A	
Mean	17.69e	20.91d	25.31c	31.65b	34.79a		
Second drying							
Dettman et al. (2012)	91.92	91.70	92.63	93.64	94.13	92.80 B	1.09
Weissbach and Strubelt (2008)	93.28	93.99	94.02	95.01	94.65	94.19 A	
Mean	92.60b	92.85b	93.32b	94.33a	94.39a		
Definitive dry matter content							
Dettman et al. (2012)	16.18	19.31	23.77	29.89	32.86	24.40 A	2.91
Weissbach and Strubelt (2008)	16.57	19.49	23.44	29.81	32.82	24.42 A	
Mean	16.38e	19.40d	23.60c	29.85b	32.84a		

CV: Coefficient of variation. Means followed by the same capital letter in the column and by small letters in the row do not differ among themselves by LSD test ($P > 0.05$).

Conclusion No difference was observed for the definitive DM content obtained with the evaluated methods in silage samples of Capiaçú grass and Zuri guinea grass, fresh and wilted, and maize.

References

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