

Can giant-reed silage be an alternative forage source for heifers and beef-cattle in an arid area?

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Objective

Due to the droughts in recent years, Hungarian researchers and farmers are in need of finding new plants to cultivate for ruminants, that are capable of growing in an ever-warming climate. The aim of this study was to research whether giant-reed (Arundo donax L.) would be ideal as a supplementation.

Methodology

Trial 1:

- Laboratory trials, the giant-reed was cut by hand in October at height of 1,6 m and packed in buckets for fermenting.
- Samples were examined with near infrared (NIR) analysis.
- Measured parameters can be seen in tables 1-3.

Trial 2:

- Giant-reed was harvested for an on-farm feeding trial.
- Cut by traditional forage harvester, with an average height of approx. 2,0-2,2 m and 20 cm stubble.
- The average yield was 15 t AF/ha, packed into a bunker silo and covered with plastic sheet.
- The ensiled material was opened and fed with heifers for four days.

Results

In the first trial, a model silage test was implemented to study the fermentability of giant-reed.

➤Based on the results, the conclusion is that giant-reed can be ensiled well and has a favorable fermentation profile in a model size.

In the second trial, 5 kg of giant-reed silage substituted 3 kg AF of triticale silage in the TMR for four days.

➤During the feeding trial, the 114 heifers did not refuse the TMR containing a 5 kg AF reed silage/day. They did not sort out the giant-reed silage from the TMR, nor leave it.

Results of Trial 1

Table 1. Dry matter, crude protein, crude fat, crude fiber and crude ash contents of the giant-reed model silage based on g/kg DM (2022.10.05., Hungary)

Dry matter	Crude protein	Crude fat	Crude fiber	Crude ash
367	86	25	377	77

Table 2. NDF, ADF, ADL, dNDF₄₈, NEI, sugar, soluble protein and nitrate content of giant-reed model silage based on g/kg DM (2022.10.05., Hungary)

NDF	ADF	ADL	dNDF ₄₈	NEI	Sugar	Soluble protein	Nitrate
762	448	54	328	4,2	<12	76	2

Table 3. The pH, NH₃ (g/kg DM), lactic acid (g/kg DM), acetic acid (g/kg DM) and lactic acid/acetic acid ratio (2022.10.05., Hungary)

pH	NH ₃	Lactic acid	Acetic acid	Lactic acid/acetic acid
4,5	11	53	9	5,9

Results of Trial 2

Table 4. Dry matter, crude protein, crude fat, crude fiber, crude ash and sugar contents of the on-farm giant-reed experiment based on g/kg DM (2023.08.08., Hungary)

	Dry matter	Crude protein	Crude fat	Crude fiber	Crude ash	Sugar
Mean	223	91	22	403	106	12
Standard deviation	2,0	0,0	1,2	5,5	7,2	0,0

Table 5. NDF, ADF, ADL, OMd, NDFd₄₈ and dNDF₄₈ contents of the on-farm giant-reed experiment. The units are in g/kg DM, unless otherwise specified. (2023.08.08., Hungary)

	NDF	ADF	ADL	OMd %	NDFd ₄₈ %	dNDF ₄₈
Mean	687	440	54	60	45	308
Standard deviation	5,1	4,4	1,0	0,8	1,3	11,3

Explanation of abbreviations, CV, BIAS, R² can be find in the abstract.



Conclusions

We can conclude the giant-reed fermentation parameters can be adequate, if the harvest and ensiling technology was well managed. In addition, the on-farm feeding trial confirmed that giant-reed harvest is feasible, and dry matter intake of heifers will not be impaired by the reed silage (5 kg AF/day/heifer), if the NDFd₄₈ value is over 40% NDF. Further investigations are needed to find more details about the optimal growing stage at harvest and month of the year, weather.