Fermentation profile of grass-legume forage ensiled with different additives

Elisabet Nadeau[1], Horst Auerbach[2], John Jakobsson[3], Kirsten Weiss[4] and Björn Johansson[5]
[1]Swedish University of Agricultural Sciences, Department of Animal Environment and Health, Skara, Sweden
[2]ADDCON EUROPE GmbH, Bitterfeld-Wolfen, Germany, [3]ADDCON NORDIC AS, Porsgrunn, Norway
[4]Humboldt University Berlin, Faculty of Agriculture and Horticulture, Berlin, Germany
[5]Lanmännen Lantbruk, Lidköping, Sweden

Introduction

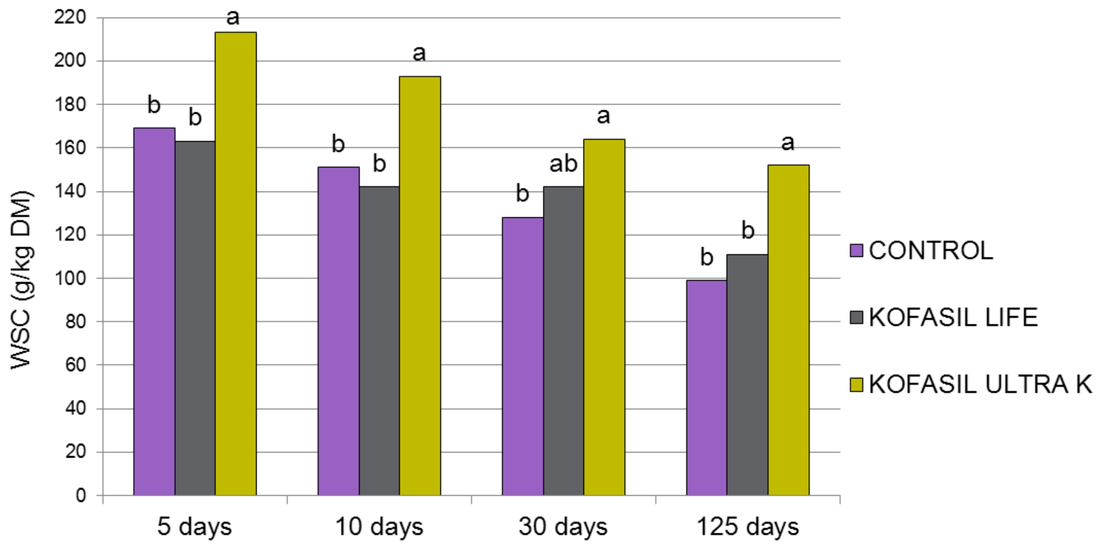
To have a better understanding of silage quality, information about the timing of fermentation and proteolysis and about the effects of additives on the fermentation profile is important.

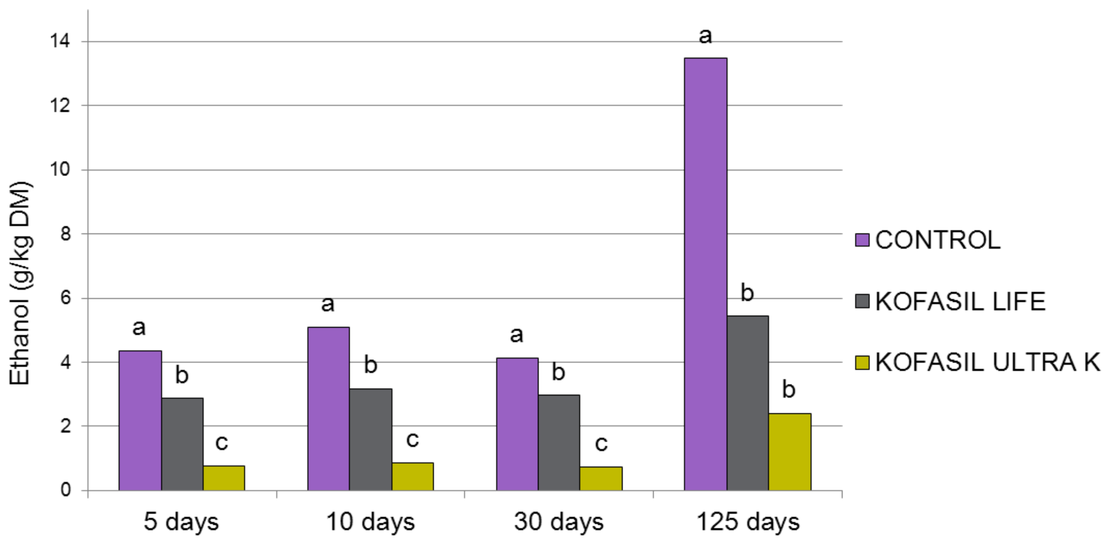
Objectives

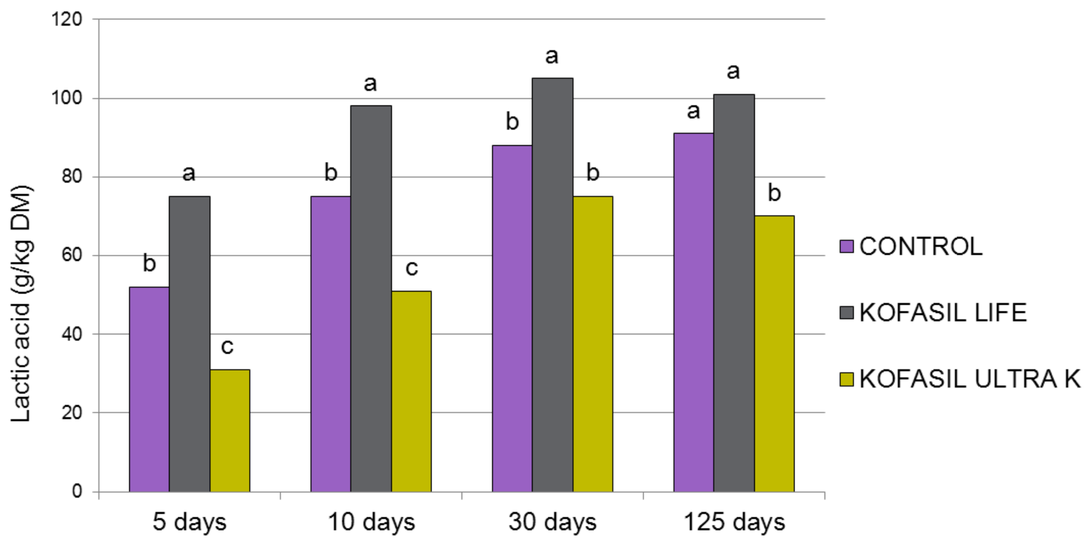
The aim of this experiment was to evaluate the effects of different additives and storage lengths on the fermentation profile of grass-legume forage.

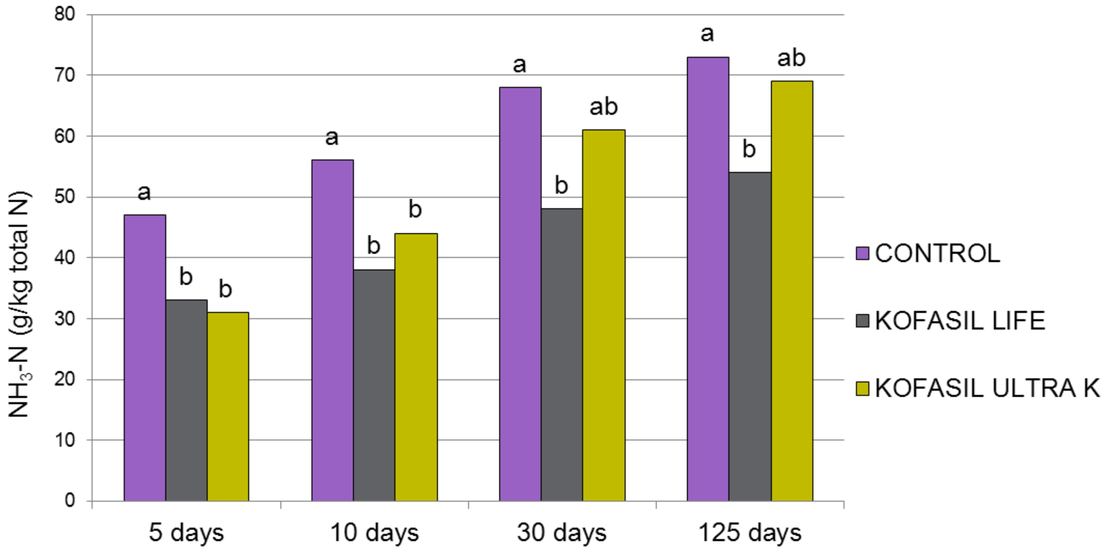
Results

- KOFASIL LIFE had a higher acidification rate (4.2 vs. 4.6, $P < 0.0001$) and a lower acetic acid (7 vs. 10 g/kg DM, $P < 0.05$) compared to the Control at 5 days of fermentation.
- pH after 125 days of storage was 4.0, 4.0 and 4.1 and acetic acid was 13, 9 and 12 g/kg DM ($P = 0.12$) of the Control, KOFASIL LIFE and KOFASIL ULTRA K.
- Aerobic stability was improved in treated silages (KOFASIL LIFE: 8.4 d, KOFASIL ULTRA K: 9.8 d vs. Control: 7.4 d at 125 days of storage, $P = 0.07$).









Conclusions

Fermentation characteristics and aerobic stability of well fermented grass-legume silage can be further improved by use of KOFASIL LIFE and KOFASIL ULTRA K as compared to silage ensiled without additives.

Materials and Methods

- A grass (77%) - legume (23%) sward was mowed on 3 June, 2010 and wilted to a DM content of 340 g/kg at Nötcenter Viken, Falköping.
- Wilted herbage was ensiled untreated or treated with additives; KOFASIL LIFE at 400 000 cfu/g herbage (*Lactobacillus plantarum* DSM 3676, 3677 and KOFASIL ULTRA K at 2 L/ton (sodium nitrate, hexamethylene tetramine, potassium sorbate, sodium benzoate and sodium propionate) in 1.7-L silos.
- Silages were stored for 5, 10, 30 and 125 days. Acidification rate was measured as silage pH after 3 d of fermentation in 0.5-L silos. Three silos per treatment and storage length were used.
- Aerobic stability of the silages was measured after 125 days of storage as the number of days reaching a temperature of 2 C above ambient temperature during a 10-d period.

Acknowledgements

This project was funded by Agroväst, ADDCON EUROPE GmbH, VL-foundation, Lantmännen R & D, AIC and SLU.