Fig. 1: Weighing trough system for recording feed intake in the experimental barn, VBZL Haus Riswick (Photo: M. Otten)

FEEDING **TALL FESCUE SILAGE** TO DAIRY COWS?

In view of the fact that drought and heat waves may occur more frequently in the future than in the past, drought-resistant grasses such as tall fescue (*Festuca arundinacea*) are becoming the subject of greater discussion and awareness. But can high milk yields also be achieved with the use of tall fescue silage? A feeding trial at the Agricultural Research and Training Centre (ARTC) Haus Riswick of the NW Chamber of Agriculture provides the results.

The four extremely dry vegetation years since 2018 have clearly shown how grassland in particular is dependent on a good water supply in order to achieve high yields and forage quality. Yield losses of 30 to 50 percent compared to the average of the years were not uncommon in the drought years in NW. The grass species tall fescue is more drought tolerant than important cultivated grasses such as perennial ryegrass, meadow fescue, timothy and smooth-stalked meadow grass. Compared to other forage grasses, tall fescue has a very pronounced root system that extends up to 2 metres deep.

This grass can therefore extract water and nutrients from deeper soil layers even under dry weather conditions. While the agronomic properties of tall fescue have been studied very intensively in recent years, there was a lack of knowledge with regard to the actual digestibility values verified on ruminants. Similarly, dairy farmers were particularly interested in how the feeding properties (e.g. palatability, feed intake) and ultimately the milk yield parameters of grass silage fed with tall fescue should be classified. In order to answer both questions, a feeding trial with dairy cows was carried out at ARTC Haus Riswick in Kleve in recent years.

Cutting maturity of the tall fescue

Particularly for tall fescue, the window of opportunity for high quality forage to support high feed intake and performance in rumi-

TAB. 1: DEVELOPMENT OF YIELDS AND NUTRIENTS OF TALL FESCUE AND PERENNIAL RYEGRASS DOMINATED GRASSLAND

Type of utilisation	date	DM dt/ha	Crude protein, % DM	Crude fibre, % DM	NEL, MJ/kg DM
Permanent grassland with perennial ryegrass	04.04.	16.55	20.0	16.0	7.31
	11.04.	20.95	19.0	16.7	7.22
	19.04.	32.96	18.5	17.8	7.13
	25.04.	41.19	17.0	19.3	6.86
Tall fescue	04.04.	15.97	18.2	18.2	6.92
	11.04.	19.67	17.0	19.1	6.83
	19.04.	25.89	16.2	19.4	6.81
	25.04.	33.87	15.3	22.1	6.48

DM = dry matter, NEL = net energy lactation
Riswick site, 2022.

TAB. 2: INFLUENCE OF THE FEEDING VARIANT ON PERFORMANCE PARAMETERS

			Mixed ration of tall fescue	Mixed ration of perennial ryegrass
Intake (per day)	Dry matter	kg	23.7[a]	23.4[b]
	Energy (NEL)	MJ	160[a]	163[b]
	Crude protein (nXP)	g	3,585[a]	3,639[b]
	ADFom	g	5,133[a]	4,790[b]
Performance	Ruminating activity	min	568	569
	Milk quantity	kg	35.3[a]	35.7[b]
	Fat content	%	3.98[a]	3.86[b]
	Protein content	%	3.43[a]	3.47[b]
	ECM	kg	34.4	34.5

ADFom = acid-detergent fibre after ashing; ECM = energy corrected milk yield; NEL = net energy lactation. Mean values that differ statistically significantly are labelled with different letters a and b

nants is relatively small, as documented by the Riswick maturity trials (Table 1).

For the feeding trial, the plant material of both grass species, perennial ryegrass and tall fescue, was harvested at the same time as the tall fescue reached optimum cutting maturity.

Structure of the feeding trial

The feeding trial was carried out with 2 × 24 cows in a cross-over design, so that both groups of animals received both rations at different times over the trial period. Two mixed rations were used, which were almost identical except for the type of grass silage. In addition to the grass silage, the mixed rations consisted of maize silage, alfalfa hay, oilseed rape meal, an energy concentrate feed and a mineral feed mixture. The proportion of grass silage in the rations was approx. 28 % of the dry matter. Feed urea was added to the mixed tall fescue ration to equalise the ruminal nitrogen balance. The energy content of the mixed rations was deliberately not equalised.

Results

In the tall fescue variant, the animals had a significantly higher dry matter intake (Table 2). Ruminating activity was comparable in both feeding groups, despite the apparently coarser-textured tall fescue material. There was no evidence of feed selection behaviour in any of the feeding variants. The type of grass silage had a significant influence on milk quantity and milk constituents. Higher energy and nXP intakes in the perennial ryegrass feeding variant led to higher daily milk quantities and higher milk protein contents. Due to the fibre-rich tall fescue silage, the milk fat content was statistically higher in this feeding variant. In relation to the energy-corrected milk yield (ECM), both variants resulted in a comparable daily yield of just under 34.5 kg.

» Due to its physiological properties, tall fescue is considered climate resilient. However, the performance potential of this grass species in relation to dairy cattle feed is dependent on a timely harvest due to its ripening behaviour. «

Hubert Kivelitz and Dr Christian Böttger

Additional digestibility measurements on mutton showed that both grass silages had high organic matter digestibilities of over 80 %. With an energy content of 6.7 MJ NEL/kg DM, the tall fescue silage was slightly lower in energy than the perennial ryegrass silage (7.0 MJ NEL/kg DM).

Conclusion

The grass species tall fescue is considered climate resilient due to its physiological characteristics. However, the performance potential of this grass species in relation to dairy cattle feeding depends on timely harvesting due to its maturing behaviour. Physiologically young harvested tall fescue has a high feed value, which was shown in the results of the feeding trial. In the present trial, feeding a mixed ration with tall fescue silage achieved a comparable ECM performance to feeding a mixed ration emphasised with perennial ryegrass.

Dr. Christian Böttger
Chamber of Agriculture NW
christian.boettger@lwk.nrw.de
Phone +49 2945 989727

Hubert Kivelitz
Chamber of Agriculture NW
hubert.kivelitz@lwk.nrw.de
Phone +49 221 5340532