Effect of long-term grazing on dry matter biomass production and heifer performance

Pavlů V. 1,2, Pavlíš L. 1,2, Gaisler J. 1, Kassahun T. 1, Hejcman M. 2, Pavlíš K. 1,

1Department of Ecology, Czech University of Life Sciences Prague
2Team of Weeds and Vegetation of Agroecosystems, Crop Research Institute

EGF 2018
Background

Czechia - shortage of herbivores (beef cattle, sheep, goats, horses) and surplus of grasslands
Question

What is the effect of intensive and extensive grazing management on dry matter biomass production and heifer performance?
Study site

- **Jizerské hory Mountains** in the northern Czech Republic at an **altitude 420 m a.s.l.**

- **granite bedrock** and medium deep brown soil (**cambisol**) – pH/KCl = 5.1, C_{ox} = 3.9%, available P content = 64 mg kg\(^{-1}\), available K content = 95 mg kg\(^{-1}\) and available Mg content = 92 mg kg\(^{-1}\)

- the mean annual **precipitation is 803 mm** and the mean annual **temperature is 7.2 °C**

- the **dominant species** in 1998 were *Agrostis capillaris*, *Alopecurus pratensis*, *Festuca rubra agg.*, *Aegopodium podagraria* and *Galium album*
Treatments

„Oldrichov Grazing Experiment“ established in 1998

(i) **extensive grazing** (EG), stocking rate adjusted to achieve a mean target sward surface height of more than 10 cm; paddock cca 0.35 ha + 0.35 ha after cut + adjacent area in late Summer; 2-3 young heifers; stocking rate over the grazing seasons was about 600 kg ha$^{-1}$

(ii) **intensive grazing** (IG), stocking rate adjusted to achieve a mean target sward surface height of less than 5 cm; paddock cca 0.35 ha + 0.35 ha after cut + adjacent area in late Summer; 4-5 young heifers; stocking rate over the grazing seasons was about 1000 kg ha$^{-1}$
Oldrichov Grazing Experiment
Sommerfrische Buschullersdorf, Jergebirge
DM production - samples were collected one per three weeks from four movable cages of the size 1m x 1m in each treatment paddock throughout the grazing seasons 2002-2017.
During each grazing season 1998-2017 (May-September) the heifers were weighed monthly.
Productivity DM biomass per year (no fertilization) IG > EG

IG: 2.4 - 5.0 DM t ha\(^{-1}\) year\(^{-1}\)
EG: 2.3 - 4.7 DM t ha\(^{-1}\) year\(^{-1}\)
Grassland productivity from April to October IG > EG
Growth of aboveground biomass during the vegetation season
Daily live-weight gain of heifers without supplementary feeding EG > IG

IG: 424 - 750 g
EG: 620 - 1020 g
Heifers live weight gain per day from May to September EG > IG
Conclusions

- Total biomass production in the grazing season was found to be higher under IG than under EG treatment.

- Heifers grazing in EG treatment had higher average daily weight gain in comparison to heifers grazing in IG.

- Seasonal live-weight output per hectare under IG was approximately 1.5 times higher than EG treatment.

- However, if state subsidies are included, EG can be more profitable under the current Czech conditions than IG and satisfies both farmer and nature conservation objectives.
Thank you for your attention