
COMPARISON OF GRAZING AREAS FOR FARMING HORSES AND CATTLE

Klusoňová I., Skládanka J.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xklusono@node.mendelu.cz

ABSTRACT

The aim of this study was to compare the grazing areas used for farming horses and cattle, assess their species composition and evaluation of grassland quality. Then the obtained results were compared with the needs of farmed animal species and the solutions which would improve the quality of grassland were proposed.

The observations took place on the farms on the northern outskirts of Brno. On the Farm 1 the dairy cows of Czech fleckvieh were bred. On the Farm 2 the warm-blooded horses were bred. The assessment of the forage species composition was carried out during the year 2012. The evaluation of grassland quality was established on the basis of species composition. Vegetation plots were used to find out the plant species representation and to assess the percentage coverage for different plant species. For evaluation of grassland quality was used the methodology developed by NOVÁK J. (2004), which divides the plants into groups according to their palatability, production ability, nutrient content and digestibility.

The grassland on the Farm 1 belonged to the category of highly valuable to valuable. The grassland quality reached the maximal value in June (83.6) and minimal in October (69.3). On the Farm 2 there was valuable grassland. This was due to a high proportion of the most valuable species (eg. *Arrhenatherum elatius*, *Medicago sativa*). The grassland quality reached the maximal value in May (70.6) and then gradually decreased to 64.5.

According to their plant species composition both grasslands can be ranked as valuable grasslands and they have a potential to provide quality forage for farmed animals. The quality of grasslands was stable during the growing season and decreased in autumn. This was caused by inconsistent management of grazing areas and selectivity of animals during grazing. To improve the quality of grasslands regular mowing of ungrazed patches and nitrogen fertilization can be recommended.

Key words: evaluation of grassland quality, grazing horses, grazing cattle

INTRODUCTION

Grazing is the oldest way of livestock nutrition. It offers natural food source for animals according to their nutritional and dietary requirements. Other benefits are the possibility of movement, social contacts and positive effect on the health of animals. Therefore grazing is one of the basic requirements of organic livestock farming. Simultaneously pastures fulfil important secondary functions and they have positive impact on the landscape character. Pastures are source of cheap fodder and especially in the foothill areas they can be the only cost-effective way of using agricultural land. Grazing can be the effective solution of animal nutrition, but it must meet the requirements of the species and category of farm animals.

The aim of this study was to find out the species composition and evaluation of grassland quality in the two specific grazing areas and then to assess their suitability for a particular type of livestock. Finally the study focuses on proposing measures which would help to improve the quality of grasslands.

Czech Republic currently does not use the potential of its permanent grasslands. But in the future due to the increase of the human population and high demand for food the importance of grassland could dramatically increase.

MATERIAL AND METHODS

Farm 1 is located on the northern outskirts of Brno at an altitude of 298 m. On grassland there were grazed the dairy cows of Czech fleckvieh with an approximate milk yield of 20 litres per day. In the stable they were also fed by grain and malt residue, approximately 2 kg a day. In addition, cows were fed with hay and feed straw. The grazing area was divided into 3 parts, which were changed after 7-10 days. Animals were grazed approximately 9 hours a day. The length of the grazing season depended on climatic conditions. Pasture was regularly treated by rolling, mowing ungrazed patches and implementing of supplementary sowing. The average slope of land was under 4°. The load of pasture was 1,4 LU.ha⁻¹.

Farm 2 is located on the northern outskirts of Brno at an altitude of 287 m. The most represented breed was the Arabian Horse, followed by Czech Warmblood and then the other breeds were represented. Most of the horses were used for recreational riding, but some of the horses were trained and used for the endurance races. Grazing was carried out throughout the year, approximately 8 hours a day. All the horses were fed in the stable by a grain according to their work load. At night they got hay or green forage. During the winter season horses on a pasture received hay as a supplementary feeding. In the stalls there were placed mineral licking buckets. Bedding material was a straw. The grazing area was divided into 3 parts which were changed according to the condition of grassland. The grassland care was irregular, only the ungrazed patches were mowed annually. The average slope of land was 7,4°. The load of pasture was 1,8 LU.ha⁻¹.

During the year 2012 the botanical composition of the vegetation was regularly evaluated on both monitored areas. The observations began in May and finished in October, excluding the month of July. They were regularly done on the 15th day of the month. To evaluate the botanical composition in the observed area the representative surface in the size of 2 × 2 m was always selected. The evaluation of grassland quality was established on the basis of species composition. The vegetation plots were used to find out the plant species representation and to assess the percentage coverage for different plant species. For the evaluation of grassland quality was used the methodology developed by NOVÁK J. (2004), which divides plants into groups according to their palatability, production, nutrient content and digestibility. Forage value of species (FV) is ranged from 8 for the highly valuable species to -4 for the toxic ones. To calculate the evaluation of grassland quality (E_{GQ}) was used the formula:

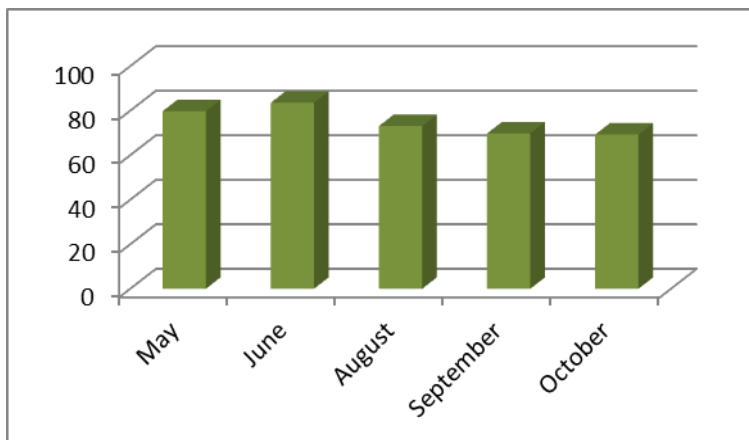
$$E_{GQ} = \Sigma(D * FV) / 8$$

D – predominance of species [%]

FV – forage value of species

RESULT AND DISCUSSION

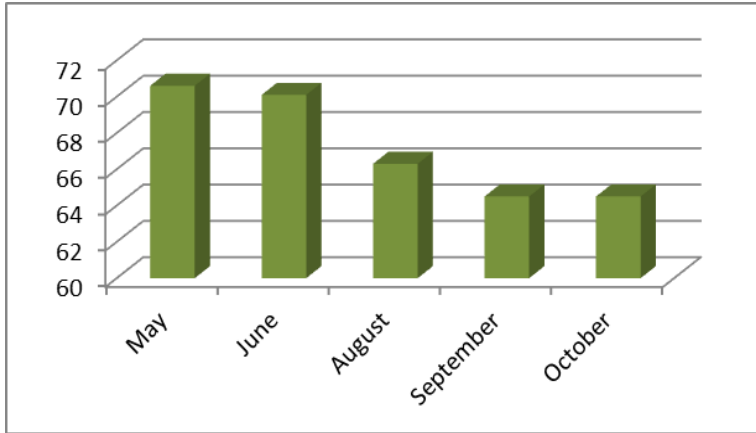
The grassland on the Farm 1 belonged to the category of highly valuable to valuable. The grassland quality reached the maximal value in June (83,6) and minimal in October (69,3). The grassland quality was stable during the growing season (Obr.1).



Obr.1 Grassland quality on Farm 1

The excellent quality of grassland was achieved by a high proportion of the most valuable plant species (*Poa pratensis*, *Lolium perenne*), which were regularly supplementarily sowed. These species are highly preferred by grazing cattle (KOBES M. 2012). This was proved by the gradual reduction of their share in the grassland during the growing season. They were preferentially grazed by cows. The grassland quality was reduced with the excessive share of *Achillea millefolium* (up to 40 %). After flowering its palatability and digestibility is reduced and it becomes unattractive for animals (SKLÁDANKA J. 2009). This may be the reason why its coverage at the end of vegetation increased. As a risky component may be sowed *Coronilla varia* (FV -4), but it is toxic only for non-ruminant animals (PELIKÁN J. et al. 2012).

According to the calculated evaluation of grassland the grazing area on the Farm 2 can be categorized as valuable grassland. Main reason was the occurrence of the most valuable plant species such as *Arrhenatherum elatius*, *Medicago sativa* (FV 7). They were abundantly represented in the grassland. The grassland quality reached the maximal value in May (70,6) and then gradually decreased to 64,5 in autumn (Obr.2).



Obr.2 Grassland quality on Farm 2

The relatively high proportion of *Medicago sativa* (up to 25 %) was caused by supplementary sowing in the past. Its share in the grassland was surprising. It is not very suitable for grazing, because it hates trampling (HAKL J. and ŠANTRŮČEK J. 2002). CHURCH D.C. and POND W.G. (1988) claim that it is the most common pasture legume in North America. PELIKÁN J. et al. (2012) says that it is not recommend for intensive grazing, but this is not that case (1.8 LU.ha⁻¹). And by SUCHÝ P. et al (2010) *Medicago sativa* is desirable plant in the pastures for horses. High proportion of *Arrhenatherum elatius* may be caused by its good competitiveness and drought resistance or its possibility of shedding seeds (HRABĚ F. et al. 2004). However, it is known as a species that is not suitable for grazing as well (STRAKOVÁ M. et al. 2007). Another reason for its expansion in the grassland could be the fact that it is not too appetizing for horses (COSYNS E. et al. 2001). Also our results show that horses do not prefer *Arrhenatherum elatius*. Its proportion on grassland was relatively high (40 %) and at the end of the vegetation it grows even more (45 %). In contrast, the coverage of the grassland by *Medicago sativa* declined steadily from 25 % in May to 7 % in September. This decline could be caused by a competition from grasses or could also be the result of a grazing selectivity of horses. *Achillea millefolium* and *Pastinaca sativa* were the most widespread species of herbs. Those reduced the overall quality of grassland. Undesirable was also a regular discovery of deleterious and worthless species (*Artemisia vulgaris*, *Cirsium vulgare*, *Carduus acanthoides*).

The grassland on the Farm 1 was properly managed so it bade a high-quality forage for cows. Its lack was a low proportion of drought resistance species. A possible solution could be supplementary sowing of *Medicago sativa* or *Festuca pratensis*. These would support good species composition of grassland and improve its nutritional value.

The species composition and the result of the quality of grassland may look satisfactory on the Farm 1. It would be appropriate to reduce the proportion of *Arrhenatherum elatius*. The horses do not feed it as willingly as anticipated. Part of its share could be replaced with *Agrostis capillaris* or *Festuca arundinacea*. This would ensure forage for horses in winter. Another problem in this area was a regular occurrence of undesirable pasture grazing species such as *Cirsium vulgare* and *Carduus acanthoides*. To prevent their spreading and to increase the proportion of *Arrhenatherum elatius* in the area it would be appropriate to carry out mowing the ungrazed patches after each pasture cycle.

CONCLUSIONS

According to their plant species composition both grasslands can be ranked as valuable grassland and they have a potential to provide quality forage for farmed animals. This fact was proved by occurrence of *Arrhenatherum elatius* and *Medicago sativa*. They are drought resistance species and in the evaluated year they stabilized and determined the quantity and quality of forage. The supplementary sowing of *Lolium perenne* showed favourably. The increasing share of this valuable grass improves the quality of produced forage. The quality of grassland was stable during the growing season and decreased in autumn. This was caused by inconsistent management of grazing areas and selectivity of animals during grazing.

Regular nitrogen fertilization (50 kg.ha⁻¹) and mowing of ungrazed patches would be adequate for increasing yield and quality of the forage and for promoting the appropriate species in the crop.

REFERENCES

- CHURCH D. C. and POND W. G., 1988: *Basic animal nutrition and feeding*. 3. vyd. New York: John Wiley & Sons, 472 s. ISBN 0-471-85246-5.
- COSYNS E., DEGEZELLE T., DEMEULENAERE E. et al., 2001: Feeding ecology of Konik horses and donkeys in Belgian coastal dunes and its implications for nature management. *Belgian journal of zoology*, 131, 2: 111 – 118. ISSN 0777-6276.
- HAKL J. and ŠANTRŮČEK J., 2002: *Pícninářská charakteristika a uplatnění českého novošlechtění vojtěšek typu falcata*. Databáze online [cit. 2013-3-18]. Dostupné na: http://www.agris.cz/zemedelstvi?id_a=116457
- HRABĚ F. et al., 2004: *Trávy a jetelovino trávy v zemědělské praxi*. 1. vyd. Olomouc: Petr Baštan, 121 s. ISBN 80-903275-1-6.
- KOBES M., 2012: *Sestavování jetelovino travních směsí*. Databáze online [cit. 2013-3-18]. Dostupné na: http://www.agroweb.cz/Sestavovani-jetelovino travnich-smesi__s1642x58703.html
- NOVÁK J., 2004: Evaluation of grassland quality. *Ekológia (Bratislava)*, 23, 2: 127 – 143. ISSN 1335-342X.
- PELIKÁN J., HÝBL M., HUTYROVÁ H., KNOTOVÁ D., MINJARÍKOVÁ P., NEDĚLNÍK J., RAAB S., VYMYSLICKÝ T., 2012: *Rostliny čeledi Fabaceae LINDL. (bobovité) České republiky*. 1. vyd. Olomouc: Petr Baštan, 230 s. ISBN 978-80-905080-2-6.
- SKLÁDANKA J., 2009: Pastevní porosty, s. 129 – 143. In: Zahrádková R. et al., *Masný skot od A do Z*. 1. vyd. Praha: Český svaz chovatelů masného skotu, 397 s. ISBN 978-80-254-4229-6.
- STRAKOVÁ M., STRAKA J., MICHALÍKOVÁ L., PLEVOVÁ K., 2007: *Kapesní atlas trav*. 1. vyd. Rousínov: Agrotis Trávníky, 46 s.
- SUCHÝ P., LESÁK J., STRAKOVÁ E., NEUMANNOVÁ K., 2010: Racionální využití lučních a pastevních porostů pro výživu koní. *Veterinářství*, 60, 7: 423 – 426. ISSN 0506-8231.