

B-3. Environmental impacts of grazing grassland (Abstracts of the International Symposium on Recent Advances in Animal Science (IS-RAAS), Joint meeting of 2nd IS-AS and 3rd IS-IFS)

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B-2. The role of diet selection in sustainable agriculture

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Recent research has shown that domestic ruminants have clear diet selection goals. They eat mixed diets and show consistent diurnal patterns of diet preference. Current theoretical explanations for these observed patterns of behaviour focus on evolutionary traits. Grazing ruminants will have evolved a foraging strategy that optimises their biological fitness (which is the ultimate currency driving natural selection). Whilst this strategy will have been modified by the process of domestication, modern domestic ruminants appear to retain many aspects of their foraging strategy from their wild forebears. These include optimising the efficiency of nutrient capture and the associated need to maintain rumen function, whilst at the same time reducing the risk of predation and the risk of poisoning from plant toxins. These diet selection characteristics need to be taken into account in the development of grazing management strategies, both those aimed at optimising their nutrient capture whilst at the same time minimising the environmental impact of the animal, as well as strategies that aim to promote biodiversity in semi-natural grazed pastures. Research in this area indicates that an understanding of the diet selection characteristics of grazing ruminants has an important role to play in the development of grazing management strategies that are both environmentally and economically sustainable.

B-3. Environmental impacts of grazing grassland

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There are specific characteristics of grasslands used for grazing such as heterogeneously-distributed nutrient input and tread pressure, which are the direct results of cattle grazing on the grassland. Since the pollution of water with nitrogen occurs when the amount of excess nitrogen in an area exceeds a certain level, the presence and intensity of the pollutant depends on the amount of nitrogen being applied in the area. This is true for grasslands even in being used for grazing or cutting. In the case of grazing grassland, since the amount of nitrogen application depends on the amount of chemical fertilizers being used and cattle density, cattle density control is obviously an essential factor in nitrogen pollution prevention.

The results of the grassland utilization experiment that compared grazing and cutting under the same application rate of chemical fertilizers were as follows: 1) Grass yield was higher in grazing than cutting, 2) Soil nutrient accumulation was also higher in grazing than cutting. However, this does not necessarily mean that there is a higher risk of nitrogen pollution in grazing grassland compared to cutting grassland. There is no difference between them in terms of risk if the nutrient enriched manure applied by grazing cattle is taken into consideration when determining the amount of chemical fertilizer that is to be applied.

This study is intended to assess the use of grasslands for grazing and nitrogen pollution in order to determine the environmental impact of the utilization of grasslands for grazing.