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BIOBIO indicator factsheet

Grazing Intensity (Graze)

Refers to Chapter 8 ‘Management related indicators’ of the Guidebook ‘Biodiversity Indicators for European Farming Systems’

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Grazing Intensity (Graze)

Description

This indicator evaluates the intensity of grazing on the pastures of the farm.

Unit: Number of livestock units (LU) per hectare grazing area.

This **pressure indicator** complements the BioBio indicator 'Average stocking rate' by adding a particular focus on the intensity of utilization of grazing areas. The indicator takes into account the actual time that livestock spends on grazing land.

Surveyor skills

Data collection can be done by technical staff (farm interviews, retrieval from databases). For data validation, skills in the interpretation of livestock data and corresponding background knowledge are necessary to examine the plausibility of both the input and output variables.

Data collection method

Data for input variables must be collected in farm interviews according to a questionnaire.

In contrast to the indicator 'Average Stocking Rate', data from official livestock databases may not be sufficient to calculate this indicator because it requires information on the grazing regime on the farm.

Calculation method

Input variables:

- livestock categories (L_i)
- livestock units for each livestock category (LU_i)
- average number of animals by livestock category on the farm (for one calendar year) (N_i)
- number of days per year that a particular livestock category spent on the farm (d_i)
- proportion of presence time that a livestock category spent on farm-owned grazing land (g_i), e.g. 80% of presence time on grazing land = 0,8
- grazing area on the farm (A_g).

$$Graze = \Sigma (N_i \, LU_i \, d_i \, g_i / 365) / Ag$$

For the estimation of presence time on grazing land (g_i), a method from the tool DIALECTE was adopted. Thereby, for each livestock category the average daily hours on grazing land are estimated for each month of the year.

Results from BioBio case studies

The average for most grazing livestock farms is below 0.5 LU/ha grazing area. Livestock in the German farms was almost entirely kept in stables, except for 2 farms where animals had access to grazing land which is obviously more intensively grazed than on other farms. On the grassland farms in Bulgaria, Switzerland, Norway and Wales, a substantial part of grazing was on the common pastures that are not part of the UAA. This kind of grazing was not accounted for by this indicator.

Grazing pigs in Spanish Dehesa farms. Photo: Gerardo Moreno, UEX

Synergies with other indicators

Synergies exist with the indicator 'Average Stocking Rate' both in data collection and interpretation.

Correlation with other indicators

'Grazing Intensity' was related to species diversity only in single cases. 'Vascular Plants' decreased with increasing grazing intensity on Hungarian grassland farms. 'Earthworms' increased with intensified grazing on Swiss grassland farms. This relation can be related to an increased dung input by grazing cows.

Estimated effort and costs (labour effort required, analysis)

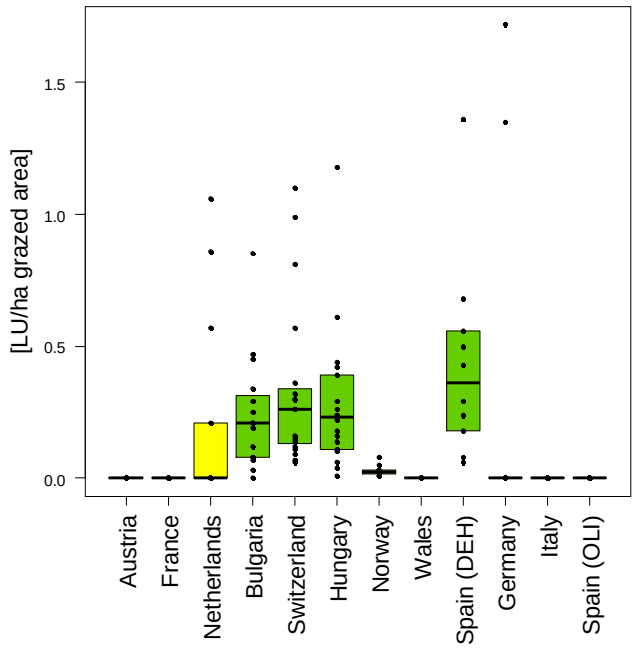
An average of 8 hours per farm must be calculated for the collection of the BioBio farm management indicators. This includes the interview, data processing and data check. However, there is considerable variation in time effort depending on the complexity of farms and the implementation (telephone interviews or farm visits).

Grazing Intensity change as an indicator

A rise in the indicator value indicates greater pressure on the land. This implies increased levels of nutrients on the pastures which may be reflected by a decrease of plant species diversity and an introduction of competitive, vigorously growing nitrophilous species.

Strengths and weaknesses

The indicator is easy to calculate, if livestock data are recorded in the interviews. It requires only some additional information on the grazing regime and the size of the grazed area.



'Grazing intensity' in BioBio case study farms (grazing livestock units per ha grazing area)
Legend: the colour of the bars signify the type of land management. Yellow: arable including horticulture; green: grassland; blue: mixed arable and grassland; pink: tree-based systems.

In large areas that are grazed by free-ranging livestock, such as the Dehesas, there may be pronounced differences in 'Grazing Intensity' between different parts of the farm, depending e.g. on accessibility and grazing preferences. Thus, the indicator 'Grazing Intensity' only reflects an average value that may not correspond to the actual pressure in some parts of the farm.

This factsheet is part of the Guidelines **Biodiversity Indicators for European Farming Systems**.
More detailed information on the set of indicators developed in the EU FP7 research project BIOBIO (Biodiversity indicators for organic and low input farming systems, KBBE-227161) is given in a printed report, published as ART Publication Series Nr. 17. The report can be downloaded from the BIOBIO website.
Printed versions can be ordered at www.agroscope.admin.ch or at Agroscope, Reckenholzstrasse 191, 8046 Zurich, Switzerland

BIOBIO Indicator Factsheets

Genetic diversity	
Breeds:	Number and amount of different breeds
CultDiv:	Number and amount of different varieties
CropOrig:	Origin of crops

Species diversity	
Plants:	Vascular plants
Bees:	Wild bees and bumblebees
Spiders:	Spiders
Earthworms:	Earthworms

Habitat diversity	
HabRich:	Habitat richness
HabDiv:	Habitat diversity
PatchS:	Average size of habitat patches
LinHab:	Length of linear habitats
CropR:	Crop richness
ShrubHab:	Percentage of farmland with shrubs
TreeHab:	Tree habitats
SemiNat:	Percentage of semi-natural habitats

Indirect management indicators / parameters	
EnerIn:	Total direct and indirect energy input
IntExt:	Intensification/Extensification - Expenditure on inputs
MinFert:	Area with use of mineral nitrogen fertiliser
NitroIn:	Total nitrogen input
FieldOp:	Field operations
PestUse:	Pesticide use
AvStock:	Average stocking rate
Graze:	Grazing intensity