Sustainability of grazing: effect of grazing on economy, environment and society

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Why grazing?

- Forage is the main feed for dairy cattle
- Predominantly grazed
- Grazing systems are important parts of the landscape
Today

- Grazing in Europe: trends and developments
- Grazing and society
- Grazing and environment
- Grazing and economy
Grasslands in Europe
Grazing in Europe

- Data on grazing hard to get
- Several surveys EGF Working Group “Grazing”
  - Educated guess on grazing dairy cattle
  - No statistical data
More than 50% grazing

- Sweden
- Finland
- Norway
- Ireland
- Luxembourg
- France
- Switzerland
- The Netherlands
Less than 50% grazing

- Austria
- Estonia
- Czech Republic
- Hungary
- Bosnia and Herzegovina
- Slovenia
- Spain
- Greece
- Denmark
Denmark and the Netherlands
Grazing in Europe

- Country specific
- East and South < North and West
- In general, the popularity of grazing is declining
  - Less cows
  - Less days yr\(^{-1}\)
  - Less hours d\(^{-1}\)
Reasons for less grazing

- To control rations and optimise grassland utilisation
  - When fed on grass only, DMI = enough to meet requirements of maintenance and 22-28 kg milk
- Increased herd size
- Increased use of automated milking systems
- Reduced grass growth in summer time
- Need to reduce mineral losses
- Labour efficiency
Effect of herd size

Bron: CBS
Less grazing

- Is this a matter of concern?
Society
Grazing system and society

- Positive image of grazing animals in the landscape
- Biodiversity of the landscape
- Society associates grazing with animal welfare
Effect of grazing on animal welfare

- Health, natural behaviour

- Natural behaviour: requirements for food, water and rest, and also behavioural needs such as movement, social behaviour, foraging and play

- Grazing gives much more scope for natural behaviour than conventional cubicle sheds
Effect of grazing on animal welfare

- Reduces risk of mastitis
- Benefits claw health
- Results in large fluctuations in diet composition
- Frequent milking more difficult
- In the field cows are exposed to rain and sun
- In the field increased risk of the transmission of infectious diseases such as infectious bovine rhinotracheitis (IBR) and bovine virus diarrhoea.

- Easier to prevent the disadvantages of grazing than to remedy the welfare disadvantages of cubicle stalls
Stakeholder consultation

- **MultiSward (2010-2014)**
  - To conceive, evaluate and promote sustainable grass based ruminant production systems
  - Participation of stakeholders was one of the key objectives of the project
  - Online questionnaire to determine the stakeholders’ view on the importance of grasslands in Europe

- [www.multisward.eu](http://www.multisward.eu)
Online questionnaire

- Stakeholders:
  - primary producer, policy maker, research and advice most important
  - followed by NGO’s (nature, environment), industry (processing, seed) and education

- 8 languages: Polish, Dutch, Italian, French, English, German, Danish and Swedish
Online questionnaire

- Almost 2000 respondents
- Respondents were asked to value 42 different functions of grasslands
  - 1 = not important
  - 5 = very important
Top 5 important functions

- Grazing: 4.2
- High quality forage: 4.1
- Beauty of the landscape: 4.0
- Dairy cow milk production: 4.0
- Low cost animal feed: 4.0
Grazing - countries
Grazing – stakeholder type
the Netherlands

- 2012: “Treaty Grazing”
- Aim: stable number of grazing cows
- ~ 60 parties signed
“Treaty Grazing”

- Dairy farmers
- Dairy industry
- Feed industry
- Banks
- Accountants
- Semen industry, veterinarians, cheese sellers
- Retail
- NGO’s, nature conservation
- Government
- Education and science
Developments dairy industry

- Grazing premium of 0.5 ct kg\(^{-1}\) milk
  - Dairy farm of 1,000,000 kg milk: € 5,000
  - Definition of grazing for the premium: minimum 120 days 6 h d\(^{-1}\)
Effect of grazing on the environment

- Grazing increases mineral losses
  - Particularly nitrogen (N), but also P
  - Import of N can increase by 50 kg ha\(^{-1}\) yr\(^{-1}\)
- Type of nitrogen loss:
  - More nitrate leaching
  - More denitrification
  - More nitrous oxide (N\(_2\)O)
  - Less ammonia volatilisation (NH\(_3\))
Effect of grazing on the environment

- Less energy use
- Less carbon dioxide (CO$_2$) emissions
- Less methane (CH$_4$) emissions
Economy
Economy

- Whole farm model DairyWise (Schils et al., 2007)
- Data of commercial farms
  - Less favourable farm situations
  - Average farm situations
Economy – less favourable farm situations

Difference between grazing and zero-grazing (€ per 100 kg milk)

No restrictions: -1.0
Automatic milking: +0.0
Small grazing surface: +1.0
Large herd: +2.0
High milk production: +3.0

Livestock Research Wageningen UR
Economy – grass intake crucial factor

The graph shows the relationship between fresh grass intake (kg DM cow$^{-1}$ yr$^{-1}$) and the difference in income of grazing relative to summerfeeding (€/100 kg milk). The R$^2$ value is 0.82. The data points are categorized by soil type: Sandy soil (filled circles), Peat soil (open circles), and Clay soil (empty circles).
Autograssmilk

- Innovative and sustainable systems combining automatic milking and precision grazing. *Ireland, France, Belgium, the Netherlands, Denmark, Sweden*

- Develop optimum feeding strategies
- New technologies
- Increase sustainability
- Optimise economic efficiency
  - Grass intake crucial factor
Sensor data

- Practical tool for farmers
  - Sustainability
Competitiveness of future milk from grazing from a socio-economic and ecological perspective

Large-scale, high productive systems
Characteristics

Management

grazing
grass supply

Interactions

Cow - Herd
Breed
Ration
Calving pattern

Grass intake
Grass utilization

Grass production
Grass quality

Grass
Type
Fertilization
Soil quality

System analysis
In-depth knowledge
Sustainability of grazing

- Advantages and disadvantages

- Grass intake a crucial factor
  - Farm situation
  - Management
  - Farmer’s attitude, preferences and knowledge

- Grazing is not a black and white story
Sustainability of grazing

Thank you!

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