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# Effect of grazing previously abandoned grassland on performance in sheep and herbage production

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# Background

- ✓ Large areas of cultivated grasslands are abandoned
- ✓ Access to grassland is limited in sheep production in Norway
- ✓ Is abandoned grassland a potential pasture resource?



# Maintenance of local grazing resources: Grazing management, meat production and animal welfare (2013-2016)

1. Lamb performance
2. Behavior
3. Pasture yield, herbage consumption and botanical composition
4. Economy
5. Social aspects





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- 1. Lamb performance**
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# Background: Sheep farming in Norway

- ✓ Winter: Indoor housing + lambing
- ✓ Spring: Pasture close to farm
- ✓ Summer: Range mountain and forest pasture
- ✓ Autumn: Pasture close to farm, until slaughter or indoor housing



# Method: Animals

- ✓ One sheep flock of Norwegian white spæl
- ✓ 83(88) ewes(lambs) in 2014
- ✓ 77(106) ewes(lambs) in 2015
- ✓ Tingvoll municipality in Møre and Romsdal County (63° 1', 8° 8')





# Method: Abandoned cultivated grassland

- ✓ a 15.3 ha grassland that has been unmanaged for 12 years situated in Sunndal municipality (62° 51', 8° 26')
- ✓ before abandonment the area was used as pasture for dairy cows





# Method: Lamb performance

The sheep flock was each year assigned into three treatments:

## 1) Control

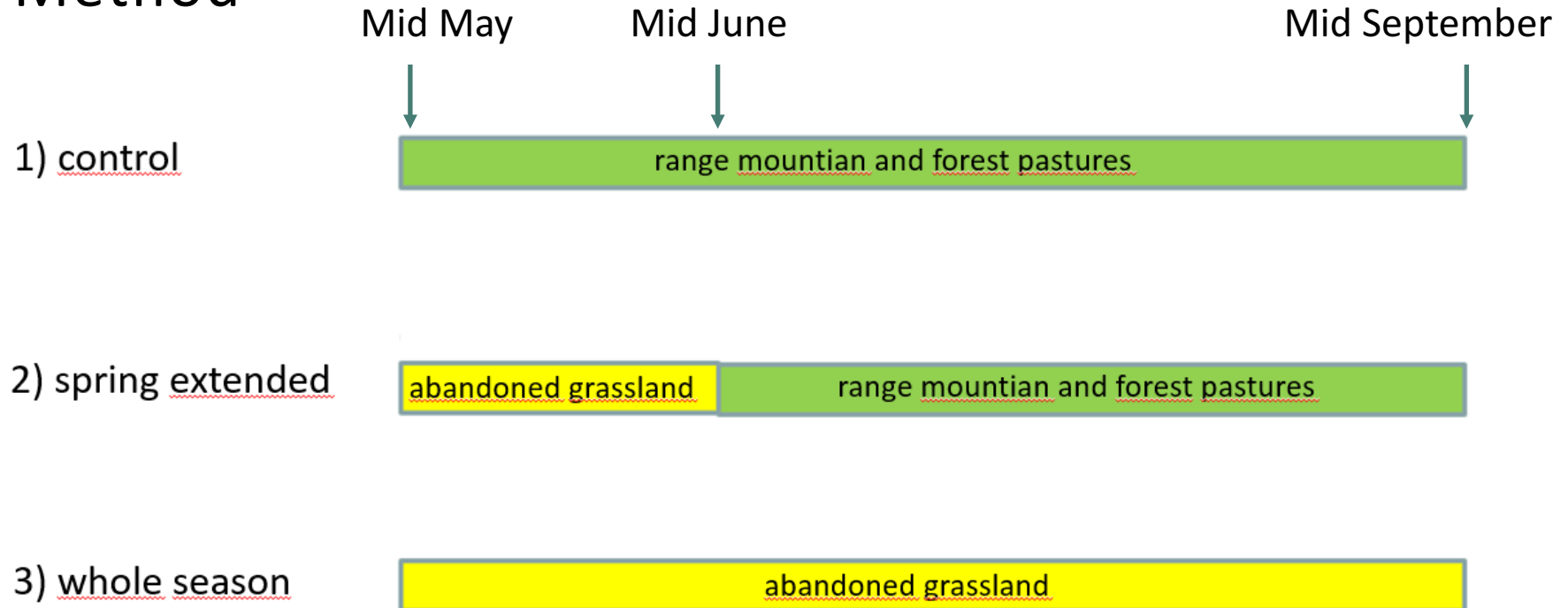
- common farm procedure with short spring grazing period close to the farm before summer grazing on range mountain and forest pasture

## 2) Spring extended

- 4 weeks extended spring grazing period on abandoned cultivated grassland before summer grazing on range pasture

## 3) Whole season grazing on abandoned cultivated grassland

# Method



# Method: Recordings lambs

- ✓ Weight: birth, spring, spring-extended and autumn
- ✓ Slaughter info: weight, carcass-characteristics and carcass value
- ✓ All lambs were treated with tick repellent at the beginning of the spring-extended grazing period.
- ✓ Ewes and lambs were monitored regularly for internal parasites.





# Method: Herbage production

Period 1 (spring)  
May 23 – June 20

Period 2 (summer)  
June 21 – Aug. 12

Period 3  
Aug. 13 – Sep. 16

Period 4  
Sep. 17 – Oct. 20

Ewes and lamb  
grazing

No grazing (contr.)

Heifers

Ewes and lamb

No grazing

Ewes grazing





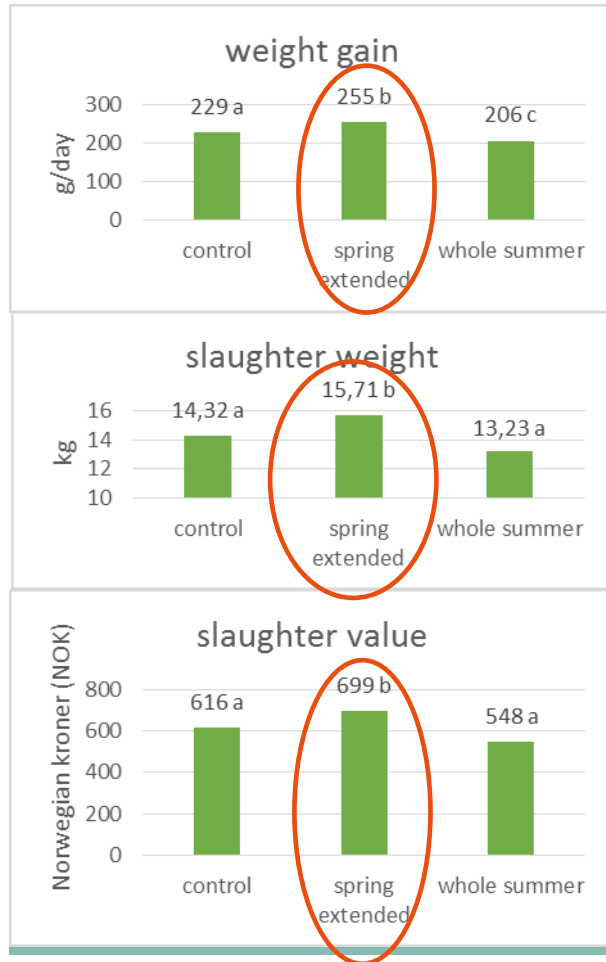
# Method:

- ✓ Biomass production and herbage intake was estimated using exclosure cages
- ✓ Botanical composition was estimated by using the dry-weight-rank method (Jones and Hargreaves, 1963)
- ✓ Results were analyzed by using the mixed procedure in SAS (SAS 2011) to discern significant effects of treatments

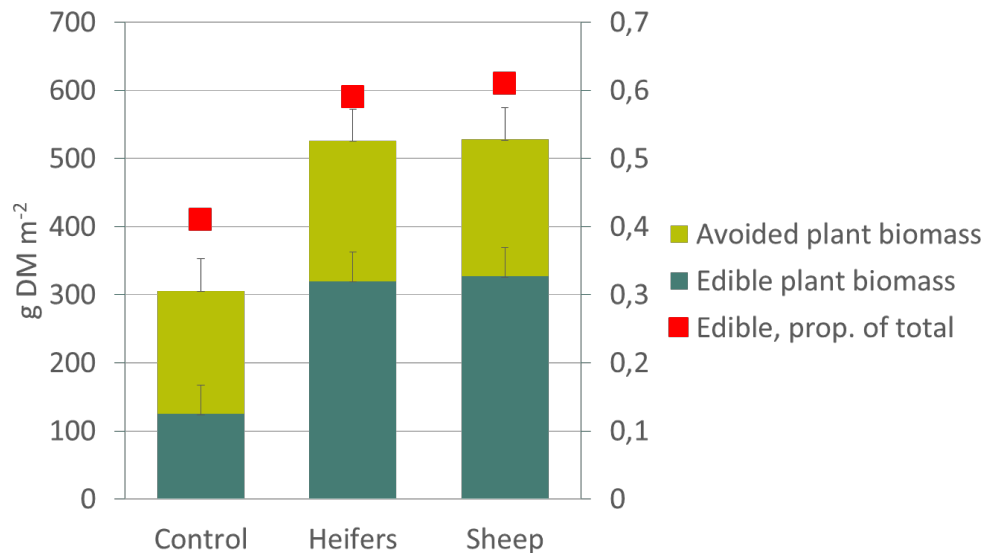




# Results: Lamb performance



# Results: Biomass production

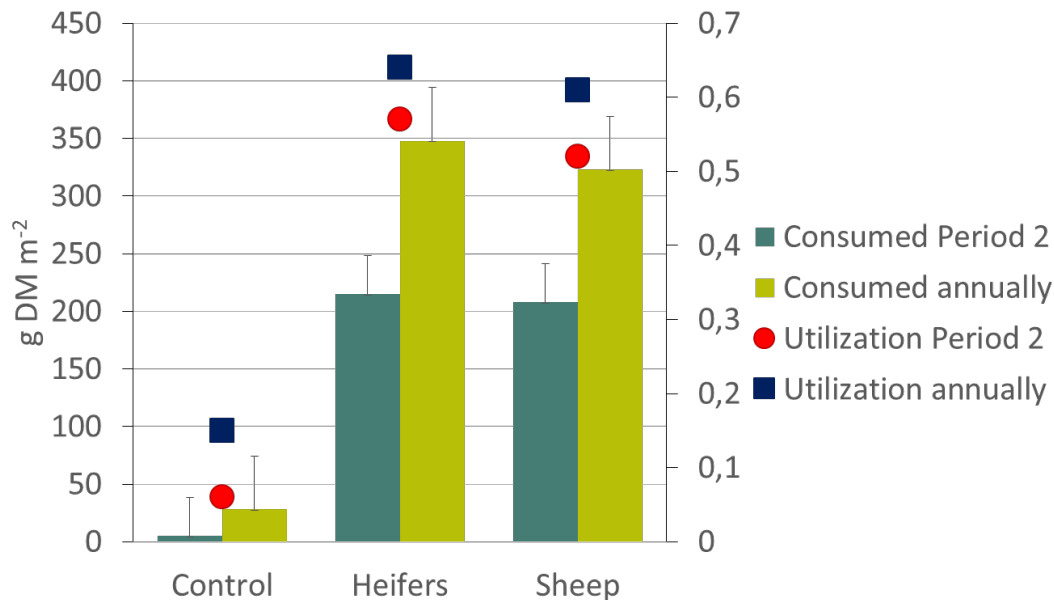


Heifers and sheep vs no grazing:

- 1.7 times higher total biomass production
- 2.6 times higher biomass production of edible plants
- 1.5 times higher proportion of edible biomass

Annual biomass production as edible and avoided (g DM m<sup>-2</sup>) and edible biomass as the proportion of total. Effect of grazing with heifers or sheep during the summer averaged across 2 years (n=6). Control is plots without grazing during period 2. Bars indicate SEM.

# Results: Herbage intake



Sheep and heifers consumed on average 211 g DM/m<sup>2</sup> and utilized about 55% of the total biomass during the summer, period 2

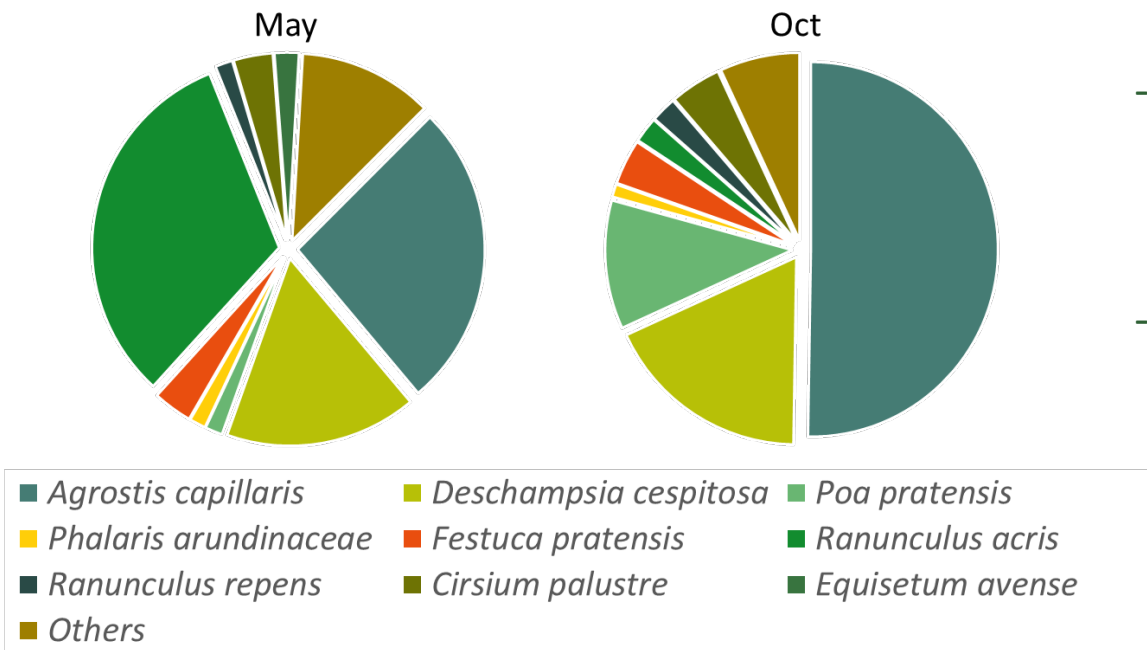
Heifers and sheep vs no grazing:

- 12 times more biomass consumed
- 4.2 times higher degree utilization of the total biomass produced

Herbage consumed (g DM m<sup>-2</sup>) and pasture utilization (proportion consumed of total biomass produced) by heifers and sheep during the summer and annually, averaged across two years (n=6). Control is plots without grazing during period 2. Bars indicate SEM.



# Results: Botanical composition



- No effect of grazing system on plant community
- Common bent (ENG) Engkvein (NO) (*Agrostis capillaris* L.) most prevailing edible plant species

Botanical composition in spring (May) at the onset of grazing and in the autumn (October) at grazing closure, averaged across 2 years

# Conclusion

- ✓ The use of abandoned cultivated grassland for an extended spring grazing period improved weight gain, slaughter weight and carcass value of lambs.
- ✓ Grazing with heifers or sheep during summertime stimulated the grassland productivity up to 1.7 times the ungrazed control plots
- ✓ Including such grassland in existing sheep farming has potential to improved performance and economy



Maintenance of local Grazing resources

Grazing management, meat production and animal welfare (2013-2016)

Thank you to:

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