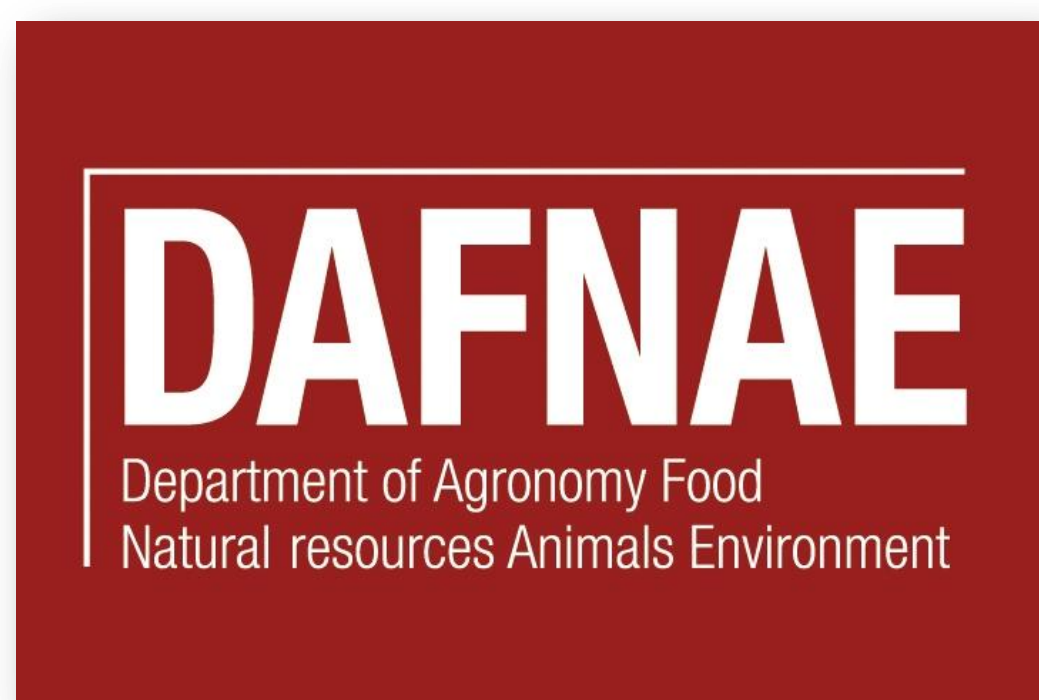


Cattle transhumance to summer farms: milk yield, pasture management and biodiversity conservation



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In the Alps, summer farms are temporary units where the livestock herds are moved during summer to graze on highland pastures

AIM: to analyze the interactions between cattle husbandry, pastures management and insect biodiversity in the summer farms of Trento province (Eastern Italian Alps).



MATERIAL AND METHODS

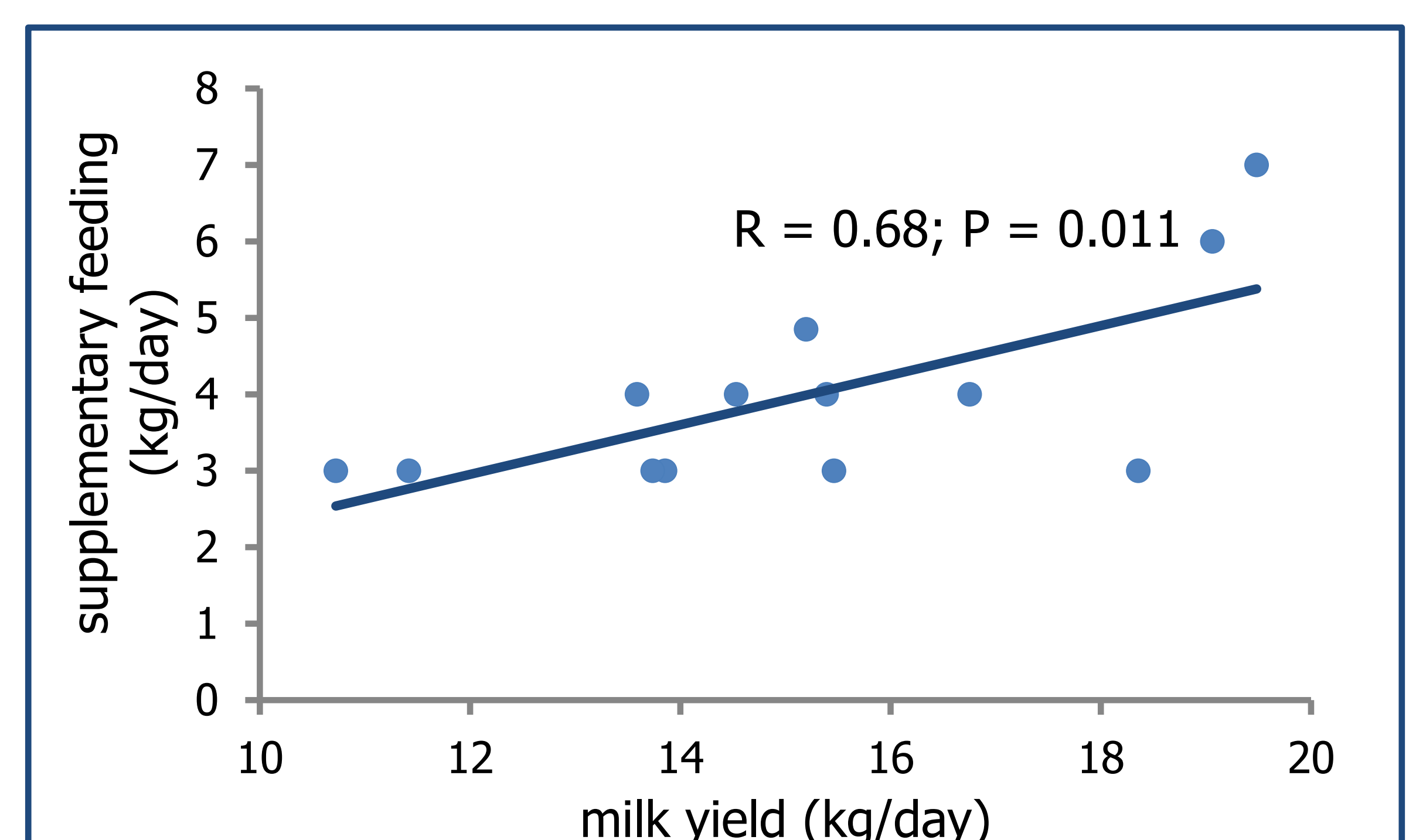
- Sample: 21 summer farms used by dairy cattle (5 with heifers and 16 with lactating cows) sampled during the summer 2012 in the Autonomous Province of Trento, Eastern Italian Alps (average elevation 1687 m asl)
- Data collected: utilized pasture surface (georeferenced on GIS), herd size and composition (breed and livestock categories), supplementary feeding (quantity and quality), milk yield and quality
- Pasture management: weed encroachment estimated at the end of the summer season in each pasture parcel of the summer farms (4 categories: from 1 = good management to 4 = high level of encroachment)
- Biodiversity conservation: butterflies were sampled and counted (3 plots at different distances from the farm)
- Statistical analysis: Pearson correlation among stocking rate, milk yield, weed encroachment and biodiversity indexes

RESULTS

Table 1. Descriptive statistics of collected data

Variable	Average	SD
Utilized pasture surface (ha)	82.8	70.5
Herd size (Livestock Unit, LU)	65	34
Stocking rate (LU/ha)	1.1	0.6
Supplementary feeding (kg/day)	4.0	1.2
Milk yield (kg/day)	15.4	2.7
Weed encroachment (weighted index)	2.9	0.4
No. insect species/farm	18.3	7.3
Insect abundance (individuals/farm)	188.8	112.7

Figure 1. Correlation between milk yield and supplementary feeding



- Milk yield: no significant correlations with stocking rate, weed encroachment and insect biodiversity indexes
- Pasture management: higher levels of weed encroachment for pastures used only by heifers than those used by dairy cows (32% of pasture surface with high level of weed encroachment vs 7%, $P < 0.05$)
- Insect biodiversity: overall we found 69 butterfly and 7 burnet moth species; the biodiversity within pasture increased with increasing distance from the farms buildings

CONCLUSIONS: livestock productivity seems more supported by supplementary feeding than by pastures management and therefore cannot be directly related to pastures conservation, as indexed by weed encroachment, and to insect biodiversity.

IMPLICATIONS: the quality of ecosystem services provided by livestock grazing in highland pastures should be considered in the planning of rural development policies