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Livestock systems, farming styles & grasslands maintenance in Alpine areas: an on farm survey in the Belluno province, North-Eastern Italy

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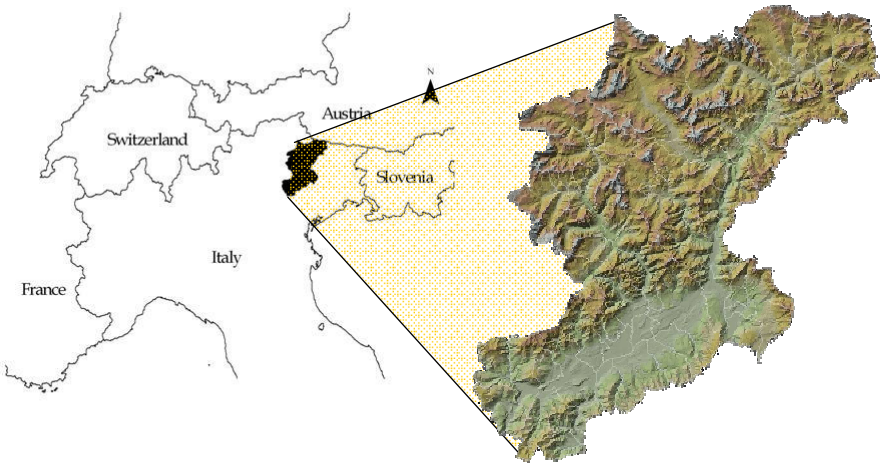
Study area: Belluno Province



Area: 3678 km²

	MIN	MAX	MEAN	SD
Elevation (m asl)	168	3313	1323	610
Slope (°)	0	86,6	26,5	15,6

Objectives

*Describe the variability of livestock production systems (**farm characteristics**) and their attitude towards grasslands maintenance.*

*Identify the various farming styles (**farmer characteristics**) and their distribution amongst farming systems.*

"… A style of farming is a concrete form of praxis, a particular unity of thinking and doing, of theory and practice." ***Van Der Ploeg, 1993***

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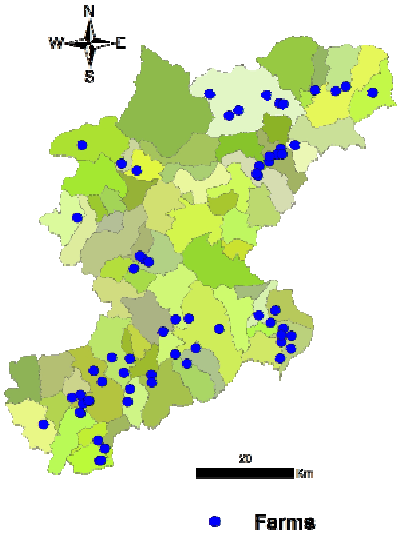
Material and methods / Sampling scheme



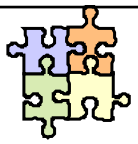
- Database CREV*
- **1444** initial farms
  - Exclusion of ceased farms
  - Exclusion of farms with less than 3 LU
- **705** retained farms

A representative farm sample was chosen, considering the herd size

- **90** sampled farms (voluntary participation to a questionnaire)
- **65** farmers agreed to take part in the study

* *CREV (Regional Centre for Veterinarian Epidemiology)*

Questionnaire structure



- Livestock system orientation and herd size
- Farm productions, services, structures and equipments
- Farmer characteristics and attitudes
- Open areas managed (meadows, pastures and arable crops)
- Public subsidies

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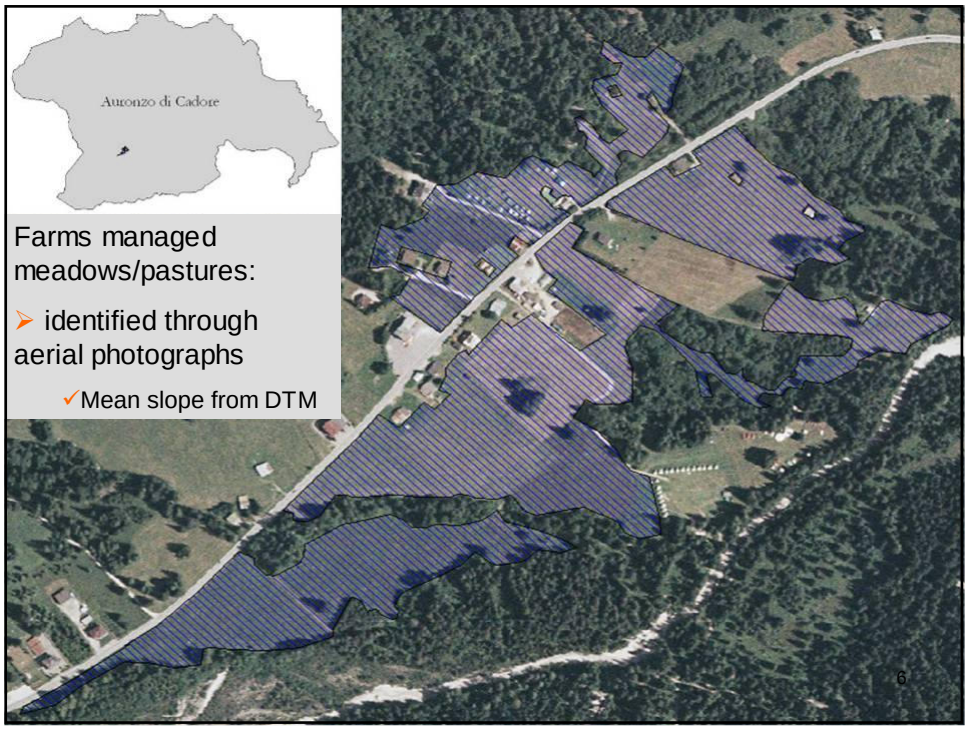

Farms managed meadows/pastures:

- identified through aerial photographs
  - ✓Mean slope from DTM

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Statistical Analysis

1. Identification of livestock farming systems → descriptive statistics
2. Analysis of farm environmental indicators
   - Comparison between livestock systems (ANOVA)
   - Correlation analysis between environmental indicators and farm size
3. Identification of *"Farming styles"* by adapting the "Non Hierarchical *K-means* clustering" (PROC FASTCLUS, SAS)

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Results /1

Identified livestock production systems

1. **Intensive beef cattle (IntBeef):** fattening cattle with characteristics similar to those of specialized fattening centres;
2. **Extensive beef cattle (ExtBeef):** raising cattle, often heifers or cows, to produce meat in an extensive production way;
3. **"Large" sheep and goats (LargeSG):** raising goats and/or sheep herds of large size;
4. **"Small" sheep and goats (SmallSG):** raising goats and/or sheep herds of small size;
5. **Intensive dairy cattle (IntDairy):** milk-producing cattle with large herd, modern equipment and production techniques and a high level of external inputs (feed and technology);
6. **Extensive dairy cattle (ExtDairy):** milk-producing cattle with a low level of external inputs and a strong relation with its territory.

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Results /2

Livestock production systems: Technical aspects

Farm		LU/Farm	Mixed[1]	Structure & Equipment[2] (%)		
F. System	*N.*	*Mean (min-max)*	*(%)*	*M*	*T*	*O*
IntBeef	2	174 *(119-230)*	0	100	0	0
ExtBeef	12	15 *(3-39)*	25	0	42	58
LargeSG	9	62 *(17-225)*	11	11	56	33
SmallSG	6	6 *(2-15)*	17	0	17	83
IntDairy	14	147 *(63-347)*	7	100	0	0
ExtDairy	22	30 *(3-122)*	32	18	55	27

[1]: *Farm with two or more livestock production systems*

[2]: *M: Modern; T: Traditional; O: Obsolete & inadequate*

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Results /3

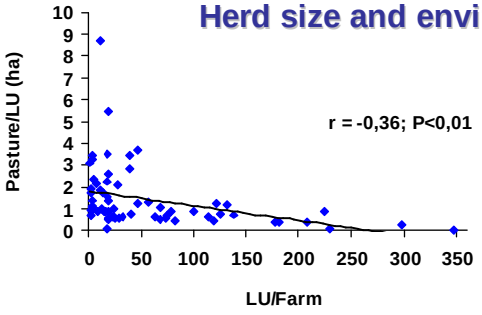
Livestock production systems: Environmental indicators

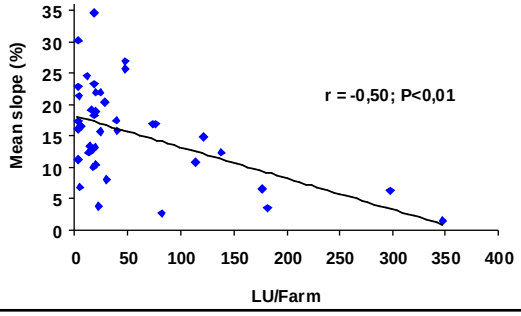
Farm		Meadow+pasture	Meadow+pasture/LU	Arable land/LU
F. System	*N*	*Area (ha) (SD)*	*Mean (ha) (SD)*	*Mean (ha) (SD)*
IntBeef	2	38,0 *(19,8)*	0,27[b] *(0,24)*	0,08[ns] *(0,10)*
ExtBeef	12	35,1 *(43,1)*	2,24[a] *(2,29)*	0,02[ns] *(0,06)*
LargeSG	9	74,4 *(78,9)*	1,28[a] *(0,97)*	0,02[ns] *(0,05)*
SmallSG	6	8,3 *(4,5)*	1,60[a] *(0,98)*	0,05[ns] *(0,09)*
IntDairy	14	65,9 *(25,3)*	0,58[b] *(0,28)*	0,09[ns] *(0,09)*
ExtDairy	22	39,6 *(40,5)*	1,61[a] *(1,27)*	0,02[ns] *(0,07)*

a, b= P<0.05

Results /4

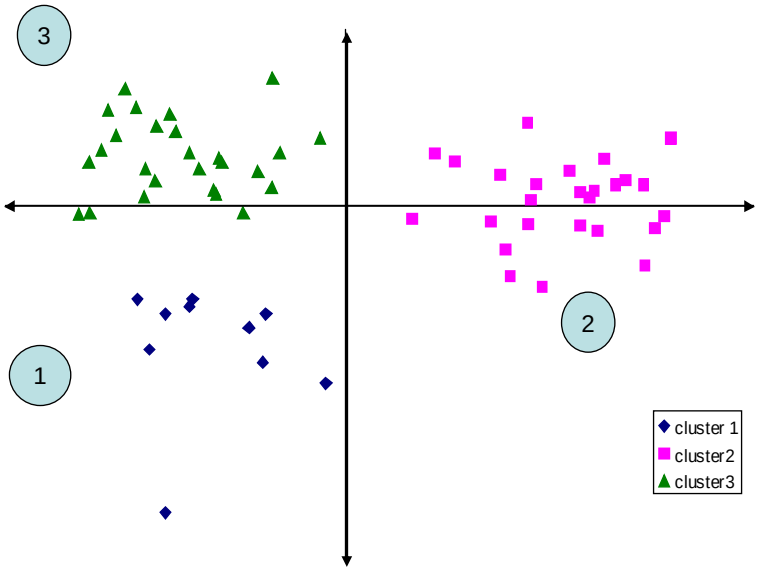
Herd size and environmental indicators





Results/5

Cluster analysis: *farming styles*



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Farming style profiles

Variable	Farming style 1	Farming style 2	Farming style 3
N°of farmers	11	28	26
N°of organic farms	1	10	-
N°of agritourisms	-	11	-
N°of cheese makers	0	7	2
Manpower	Low	High	Low
Age (mean ± SD)	43 ± 9	42 ± 11	52 ± 14
Education level (prevalent)	Intermediate	High	Low/Intermediate
Agr Training and events	Low	High	Intermediate
Economic motivation	High	Low	Moderate /low
Landcare devotion	Moderate	High	High
Passion for animals	Moderate	High	High
Interest in products transformation	Low	Moderate/high	Low
Farm prospective	Maintenance	Expansion	Closure/Maintenance
Subsidies	+	+++	++
Cluster definition	Production oriented	Innovative	Traditional

Distribution of farming styles amongst farming systems

Farming systems \ Farming styles	1	2	3	Total
ExtBeef	1	3	8	12
LargeSG	4	4	1	9
SmallSG	-	3	3	6
IntDairy	4	8	2	14
ExtDairy	2	10	10	22

Test $\chi^2 = 21.32$; df=8; $p<0.01$

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Conclusions/1

- In the Belluno province 6 different livestock production systems and 3 different farming styles were identified.
- The same livestock production system may be managed with different *farming styles*.
- However, some trends can be identified:
  - The *"Production oriented"* farming style is less frequent (17% of farmers) and is typical of **IntDairy** and **LargeSG** (dairy goats) livestock systems:
    - Economic viability but dependent on milk market
    - Low concern toward landscape maintenance

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Conclusions/2

- The *"Innovative"* style is more common (43% of farmers) and is typical of **IntDairy** and **ExtDairy** systems → sources of income:
  - Diversification
    - Agritourism
    - On-farm cheese making
  - Maintenance of grasslands
  - Too much innovation…? (Agritourism)
- The *"Traditional"* style is also frequent (40% of farmers) and is typical of **ExtBeef** and **ExtDairy** systems:
  - No future in present conditions
  - No capacity of innovation
  - Closure of farm and loss of open areas?

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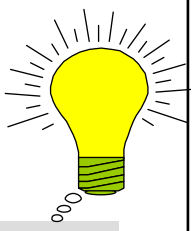
Conclusions/3



The knowledge of farming styles and their distribution within livestock production systems should help us to better define the support strategies.

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Thank you for your attention

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