



Food and Agriculture
Organization of the
United Nations



“Mountains are agroecosystems for people”

**eBook of Abstracts of the 1st Joint Conference of
EAAP Mountain Livestock Farming Working Group
& FAO-CIHEAM Mountain Pastures Sub-Network**

Virtual meeting



Domžale - Slovenia, 7 – 9 June 2021

Publishers:

University of Ljubljana, Biotechnical Faculty, Department of Animal Science, Domžale, Slovenia
University of Torino, Department of Agricultural, Forest and Food Sciences, Torino, Italy
University of Padova, Department of Animal Medicine, Production and Health, Legnaro (PD), Italy

Editors:

Giampiero Lombardi: Department of Agricultural, Forest and Food Sciences - University of Torino, Italy
Giulio Cozzi: Department of Animal Medicine, Production and Health - University of Padova, Italy
Marija Klopčič: Biotechnical Faculty, Department of Animal Science - University of Ljubljana, Slovenia

Scientific Committee of the Conference

- Giulio Cozzi, coordinator Mountain Livestock Farming across commission of EAAP
- Giampiero Lombardi, coordinator of FAO-CIHEAM MP
- Claudio Porqueddu, coordinator of FAO-CIHEAM Pasture and forage crops network
- Isabel Casasús, CITA-Aragón, Spain
- Alain Peeters, Rhea Environment, Belgium
- Margarita Joy, CITA-Aragón, Spain
- Daniel Villalba, Universitat de Lleida, Spain
- Manuel Schneider, Agroscope, Switzerland
- Massimiliano Probo, Agroscope, Switzerland
- René Baumont, INRA, France
- Bruno Martin, INRA, France
- Vibeke Lind, NIBIO, Norway
- Tzach Glasser, Ramat Hanadiv Nature Park, Israel
- Michele Lonati, University of Torino, Italy
- Grete H. M. Jørgensen, NIBIO, Norway
- Giovanni Peratoner, Laimburg, Italy
- Anna Zuliani, University of Udine, Italy
- Alberto Bernués, CITA-Aragón, Spain
- Matthias Gauly, University of Bozen-Bolzano, Italy
- Georgios Arsenos, Aristotle University of Thessaloniki, Greece
- Werner Zollitsch, BOKU University, Vienna, Austria
- Claire Morgan Davies, SRUC, Scotland, UK
- Øystein Holand, Norwegian University of Life Sciences, Norway
- Simone Ravetto Enri, University of Torino, Italy
- Peter Dovč, University of Ljubljana, Slovenia
- Karmen Erjavec, University of Novo mesto, Slovenia
- Matej Vidrih, University of Ljubljana, Slovenia
- Marija Klopčič, University of Ljubljana, Slovenia

Year of publication: **2021**

All extended abstracts are reviewed by two independent reviewers selected from the Scientific Committee of the Conference

<https://repozitorij.uni-lj.si/IzpisGradiva.php?id=127717>

Kataložni zapis o publikaciji (CIP) pripravili v
Narodni in univerzitetni knjižnici v Ljubljani

COBISS.SI-ID 72368387

ISBN 978-961-6204-78-1

(Biotechnical Faculty, Department of Animal
Science, PDF)

Mountain dairy farming in North-West Italian Alps: comparing environmental, economic and social aspects

Blanc S.^{1*}, Verduna T.¹, Merlino V. M.¹, Cornale P.¹, Battaglini L. M.¹

¹ Department of Agricultural, Forest and Food Sciences, University of Turin, Grugliasco, Torino, Italy; simone.blanc@unito.it

Keywords: livestock farming systems; life cycle assessment; life cycle costing; human-edible feed conversion; mountain.

Introduction: Agriculture in general and livestock farming in particular are strategic to the economy. At the same time, they generate a growing debate for the social implications of resource use and food competition from livestock, which has one of the highest environmental impact amid productive activities in the European Union and leads to a reduction of edible crops for humans.

Aim of this work is to analyse the three concepts of sustainability (environmental, social and economic) applied to different dairy farming scenarios of the Alpine environment. In order to do so, the production of a traditional cheese (*Toma di Lanzo* cheese) obtained in a mountainous regions of Piedmont - North-Western Italy - was analysed.

Materials and methods: The case study used refers to dairy farms and the derived *Toma di Lanzo* cheese. The farms were selected to be a representative sample of the dairy sector in the Lanzo Valley in North-Western Alps of Italy. The dairy farms studied are family-run, generally with less than 100 dairy cows, and lead the herd to alpine pastures in summer. The cows' diet is based on pasture and conserved fodder, mainly hay, plus concentrates.

Four different scenarios were studied: Indoor Winter Feeding (IWF), Valley Bottom Grazing (VBG), Mountain Pasture Grazing (MPG) and Alpine Pasture Grazing (APG). For each scenario the grazing, milking, cheese making, and transport phases were analysed.

The methodologies used in the study were either the Life Cycle Assessment, to evaluate the environmental impact of each scenario and the Life Cycle Costing, to evaluate costs, profitability and human-edible feed conversion efficiency to evaluate feed-food competition.

Results: The study showed that the herd management systems mainly based on the use of summer pasture and exploitation of land resources (MPG and APG scenarios) guarantee a reduction of 47% of kg CO₂ equivalent emissions when compared to traditional high-input farming systems (IWF and VBG). Moreover, mountain farming systems guarantee a higher profitability of technical and economic factors used for the same output in the lowland environment (APG is 7 times more profitable than IWF).

With regard to food competition in livestock farming, which implies a reduction in the use of crops and feedstuffs edible by humans in the animals' diet, pasture systems and grass-based feeding systems are ones of the most sustainable ways to produce milk.

Conclusion: *Toma di Lanzo* cheese is an example of a sustainable production system, thanks to the use of mountain resources and the maximisation of the food conversion index offered by grazing.

It is clear that the existence and survival of mountain livestock systems depends on these, preferably autochthonous breeds, which have a positive impact on sustainability aspects such as biodiversity conservation

The economic results underline the importance of developing farming systems with a low percentage of off-farm inputs. Moreover, *Toma di Lanzo* cheese – which is highly dependent on alpine ecosystem resources - has a positive impact on the economic survival of these fragile areas, as well as on the maintenance of production traditions, clearly providing relevant ecosystem services.

In general, mountain livestock systems present several criticalities mainly linked to social factors and it's desirable an improvement in the quality of life of farmers and at the same time of the competitiveness of these enterprises.

Human indicators confirm that pasture and grass-based feeding systems are more sustainable in dairy production. Therefore, the reduction of concentrates, cereals and legumes, in the animal diets reduces food competition with humans and improves the sustainability of traditional dairy farming systems in the alpine regions.