



UNIVERSITY OF LIFE SCIENCES
"KING MIHAI I" FROM Timisoara
**Multidisciplinary Conference on
Sustainable Development**



20 MULTIDISCIPLINARY
CONFERENCE ON
26 SUSTAINABLE
DEVELOPMENT

21 – 22 May 2026

Reducing the carbon footprint associated with cow milk production based on ration structure

Neamt Radu^{1*}, Neculai Dragomir¹, Saplacan Gheorghe¹, Neciu Florin¹, Mihali Ciprian¹, Mizeranschi Alexandru¹, Czisster Ludovic^{1,2}

¹Research and Development Station for Bovine Arad

²University of Life Sciences "King Michael I of Romania" from Timisoara,

Abstract: *The aim of the current research was to assess the possibility to reduce the milk specific carbon footprint. Four botanical groups based on alfalfa, chicory, Sudan grass and gramineous were tested in this respect. Based on the high carbon storage capacity and milk production, the specific carbon footprint of chicory was the lowest.*

► Introduction

The necessity of determining the quantity of carbon stored in the plants is the primary motivation behind evaluating the carbon footprint related to milk production. Establishing a balance between the amount of carbon contained in the feed ration and the amount of milk obtained from it is the key to productive efficiency evaluated through the specific carbon footprint.

► Material and method

The carbon content of the forages was determined by wet oxidation protocol. The milk yield was assessed according to botanical structures based on Performances Recording Scheme. Unifactorial ANOVA protocol was performed in order to test the ration differences occurred related to milk yield and carbon footprint. The carbon footprint was evaluated in respect with botanical structures and milk yield.

► Results and discussions

The higher milk yield was associated to chicory (20.11±0.74 kg/day) compared to alfalfa (17.1±0.17 kg/day), Sudan grass (15.8±0.26 kg/day) and gramineous (15.1±0.9 kg/day), the differences being significant ($p \leq 0.01$). In terms of carbon, the milk yield obtained from chicory-based ration recorded the lower carbon footprint (3.17 kg CO₂ eq/kg milk) compared to alfalfa, Sudan grass and gramineous (3.48, 3.51, 4.1 kg CO₂ eq/kg milk, $p \leq 0.001$).



► Conclusions

The positive effects in reducing the milk carbon footprint and increasing milk yield rightfully recommend the chicory as an appropriate forage in cows feeding.

Acknowledgement: This work was supported by Research and Development Station for Bovine, Arad, Romania. throughout the projects 7229/25.10.2024