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Fertility and management parameters in a tool for the simplified evaluation of global warming potential related to the milk production

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Introduction

For **improving sustainability of the dairy sector**, farmers and technicians need to have reliable and **easy tools** to identify the strategies that **make the best use of resources, minimizing the environmental impact**. In this sense, the overall efficiency of the farms should be considered, including fertility and management parameters of the herd.

Materials and Methods

The aim of the study was to develop an **equation for the evaluation of global warming potential (GWP), related to milk production**, starting from results of the **Life Cycle Assessment** analyses and **technical variables about management of the herd and land area**. **Data of fertility and management of the herd** were provided by Associazione Nazionale Allevatori della Razza Frisona, Bruna e Jersey Italiana (ANAFIBJ).

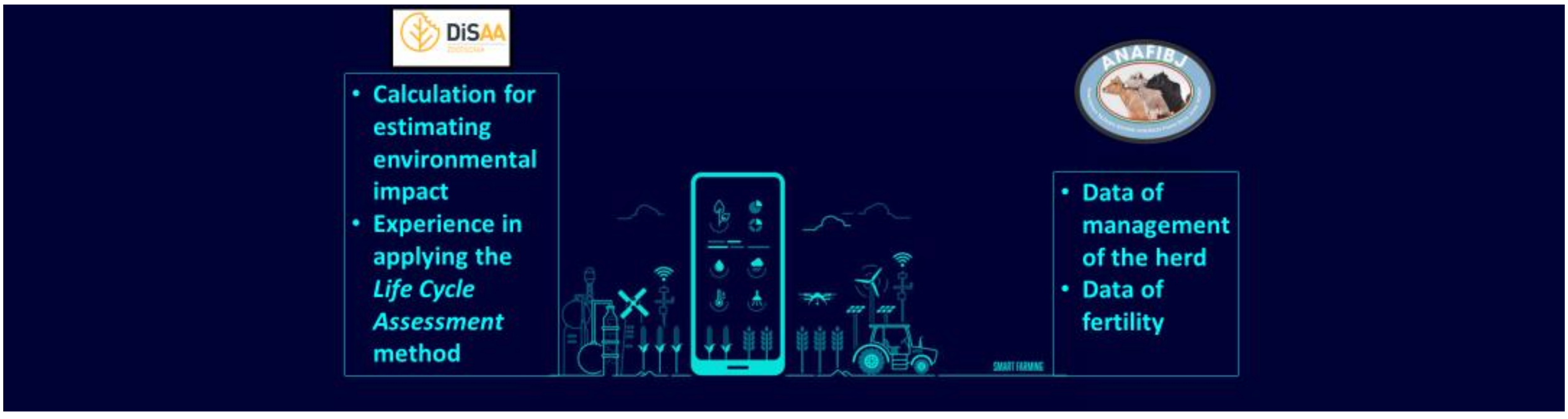
A GLM procedure was performed, on **25 dairy farms**, to build an equation suitable to estimate the GWP of milk production at farm level (kg CO_2eq/kg FPCM, fat and protein corrected milk).

Results

The best equation to estimate GWP of 1 kg of FPCM, included the following variables:

Alfalfa on total land %	**Lactation duration**
Dairy efficiency	**Pregnancy rate**
Milk protein content	**FPCM/hectare**
Primiparous cattle restocking	**Number of lactation/cow**
Amount of feed self-produced	**Individual daily milk production**
Cornsilage %DMI	**Interpartum**

The average value of GWP, for the 25 farms, was **1.45 kg CO_2eq/kg FPCM (SD 0.25).**



Conclusions

The tool enables to have findings quickly, by providing a **method easily applicable on farm scale, without the need for tabulated data or empirical formula**. The tool allows farmers and technicians to compare different management strategies to enhance sustainability. In addition, it allows using already existing data concerning fertility and management of the herd, which means finding a clear vision of milk production sustainability at national level and its trend over the time.

References

De Boer, I. J. (2003). Environmental impact assessment of conventional and organic milk production. Livestock production science, 80(1-2), 69-77.

Bava, L., Sandrucci, A., Zucali, M., Guerci, M., & Tamburini, A. (2014). How can farming intensification affect the environmental impact of milk production?. Journal of Dairy Science, 97(7), 4579-4593.

Laca, A., Gómez, N., Laca, A., & Díaz, M. (2020). Overview on GHG emissions of raw milk production and a comparison of milk and cheese carbon footprints of two different systems from northern Spain. Environmental Science and Pollution Research, 27(2), 1650-1666.