

CLIMALAIT: Adapting to climate change for resilient French dairy farms

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Abstract

CLIMALAIT is a multi-partnership applied research program initiated by CNIEL and led between 2015 and 2019. This initiative aimed at studying the evolution of climate over the century, and its impact on dairy farms. It resulted in the collective identification of adaptation levers for twenty dairy areas across France.

The objectives of the project were the following:

- Assess the impacts of climate change on French dairy farming systems in the near and distant future,
- Raise awareness and help dairy farmers (and advisors) adapting to climate change in the near and distant future,
- Anticipate research needs.

Dairy farmers' and advisors' discussions during the Climalait program showed the relevance of working on the adaptation of dairy farms' building to warm weather (dairy cows suffer from heat stress, with consequences on animal welfare and on milk production). Thus, a multi-disciplinary project was launched and resulted in an action plan and recommendations on farm buildings adaptation to fight dairy cows' heat stress.

- Climalait : multi-partnership initiative initiated by the CNIEL and led by the following partners (alphabetical order) : Arvalis, BTPL, Chambres d'Agriculture, Cniel, INRAe, French Livestock Institute (Idele) and Météo France.
- For each dairy area studied, one summary paper has been written and is [available on Cniel's website](#) (in French)
- The results from Climalait study led to a work on adaptation of dairy farms' buildings to fight heat stress: multi-partnership work (Cniel, French Livestock Insitute, Chambres d'Agriculture, GIE Elevages de Bretagne, BTPL, GDS France, FRGTV Pays de Loire, MSA, ISA Lille, Adice)

Introduction

Climate change is already a reality, especially for dairy farmers. Their activities are impacted by extreme climatic events such as draughts, heatwaves, but also by a more permanent climate change (drier and

hotter summers, rainy mid-seasons...). It is a necessity for them to adapt both their practices and installations in order to keep their activities running, with minimal impact on animal welfare.

France has a very diverse territory, in terms of topography, pedoclimatic conditions...An only solution cannot be applied everywhere.

The French dairy sector initiated this work to give dairy farmers an insight of what the climate in their area will be in the future. It is a basis for strategic thinking on the changes they could implement to ensure resilience.

Materials and methods

Dairy areas have been defined based on their characteristics (pedoclimatic, ...). Among those, twenty different areas distributed among the French territory have been studied

For each of them, the approach was divided in three stages:

- Describing climate evolution trends:

Three different simulations from three different climate research labs, based on GIEC's RCP 8,5 scenario, were used and applied to local context: Aladin datas from a French lab (Centre National de la Recherche Météorologique / Météo-France), SMHI datas from a Swedish lab and KMNHI from a Dutch lab.

- Describing the impacts of this evolution on forage crops and on dairy systems,

Thanks to STICS ("Simulateur multIdisciplinaire pour les Cultures Standard"), a crop growth model from INRAe, the impact of climatic evolutions on crops is assessed.

- Bringing to light the potential adaptation levers for the dairy area studied (in co-construction with dairy farmers)

In order to identify adaptation levers for a given dairy farming system, a working session based on a tool (serious game) called « Rami Fourrager » [\[CJ1\]](#) is organized with a group of dairy farmers.

This tool, is used in the program to consider impacts of climate change at a farm's scale, taking into account each farming system's specificities. Thanks to a computerized model, the group can test live the benefits of different levers on fodder stock in several climate scenarios.

Results

Twenty dairy areas have been studied. In each area, a working group composed of several farmers went through the three stages described above. For each studied dairy area, the results of the study have been synthetized in a summary paper.

The 20 summary papers (one per area) are freely available online. They are a synthesis of climatic scenario to be expected in each area, and potential consequences on dairy farming.

Based on working groups feedback, a set of zone-specific adaptation levers for each dairy area studied has also been defined. These levers aim at proposing practical solutions for adaptation, for example fodder and grazing management changes. Most of them do not represent additional costs for dairy farmers.

Discussion

This initiative is a multi-partnership one with acknowledged structures in their skilled area, making the results robust and more widely shared.

The increased value of the initiative is the fact that identified levers are zone-specific and co-constructed with local dairy farmers. Therefore, the levers identified are more easily adopted by local actors.

CNIEL now carries out the deployment of Climalait' results among the dairy sector, to enlarge the dissemination of the acquired knowledges upon the largest number of actors of the French dairy sector.

Conclusions of this program are also used as an element for bigger and long term investments, such as farm buildings. Indeed it is important that they are conceived and built taking into account future climate conditions to limit dairy cows heat stress.

Conclusion

The French dairy sector's environmental strategy relies both on reducing its impacts and adapting to climate change. This multipartnership program is a cornerstone of the adaptation strategy.

Based on sound science, it also brings together dairy farmers so they are actors of the proposed solutions. This approach has been recognized as a solution by the French Ministry of Environment.

References

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