REDUCING THE EMISSIONS INTENSITY OF LIVESTOCK PRODUCTION:

CASE STUDIES OF SUCCESS

GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

FRANCE

Scale: National
System: Mixed
Sector: Dairy

LIFE CARBON DAIRY: reducing the GHG emissions intensity of dairy farming in France

Techniques exist to reduce GHG emissions from livestock farming, which have also been shown to improve productivity. However, demonstrating these links and encouraging their further uptake at the farm level can be challenging. By disseminating these techniques across 4,000 dairy farms, the French carbon dairy action plan aims to support farmers to reduce the carbon footprint of milk by 20% over 10 years.

Background

France is Europe's second largest milk producer (after Germany) and contributes 3.5% of the global milk production. The dairy industry is a key driver of the national economy, generating €28 billion in revenues and 123,000 jobs. The national herd is around 3.7 million dairy cows, with milk produced on 76,000 dairy farms each keeping an average of 70 dairy cows. These farms cover different housed and grazing production systems, based on different forage areas available in the flat plains and mountain regions. The dairy sector represents 7% of GHG emissions, including dairy herd and land associated with milk production and energy consumption.

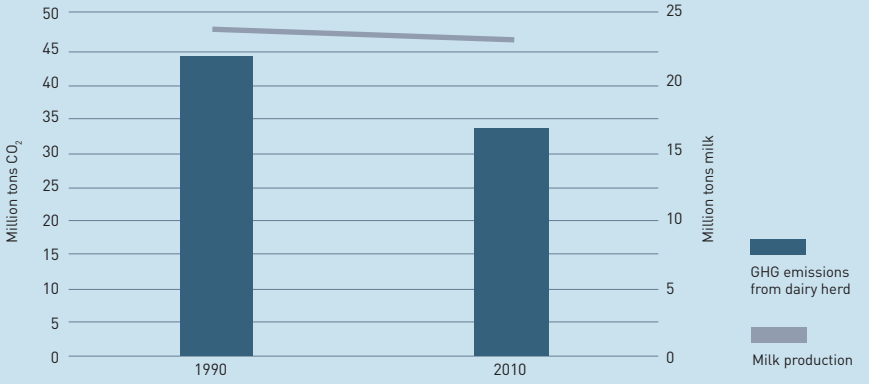
Key actions & their effects on productivity, income & food security

Between 1990 and 2010, milk yield per cow was improved to the extent that milk production under the EU milk quota could be maintained even with a 30% reduction in the number of dairy cows. Milk productivity per cow went from 4,700 kg milk/cow in 1990 to 7,000 kg milk/cow in 2010. The increase in milk yield was the result of genetic progress combined with improvements to farm practices. These practices focused on feed efficiency (forage quality, quantity of concentrate regarding milk production per cow) and herd management (milk quality, action plan to reduce mastitis etc) and were taken up via farm advisory programs. At the same time, thanks to the 1993 EU nitrates directive, farmers also received advice focused on improved practices for manure management (e.g. storage facilities, spreading techniques), which has resulted in a reduction of use of mineral fertilizers.

Effect of actions on emissions intensity of livestock production

The national dairy herd (comprising dairy cows, heifers and their associated surfaces and inputs), contributed 44.31 and 33.75 Mteq.CO_2 in 1990 and 2010 respectively. This decrease in dairy GHG emissions (resulting from reduced dairy cow numbers, improved productivity and fertilizer use), combined with the stabilization of the milk production resulted in the milk carbon footprint reducing from 1.4 kg CO_2 eq/kg milk to 1.1 kg CO_2 eq/kg milk during the last 20 years (Figure 1).

Figure 1: Milk production and GHG emission from French dairy herd



To help the French dairy sector continue to achieve reductions in emissions intensity, a 'LIFE CARBON DAIRY action plan' has been introduced that aims to reduce the carbon footprint of milk production by 20% over 10 years, thereby avoiding emitting 140,000 tons of CO_2 eq. The plan, funded by the European Commission (LIFE) and the French Ministry of Agriculture, is being rolled out across six pilot areas representing 65% of national production.

The LIFE CARBON DAIRY action plan includes a tool (CAP'2ER) for farmers and farm advisors to assess the carbon footprint and evaluate other environmental impacts at the farm level. CAP'2ER will help build a national picture of the milk carbon footprint, by calculating the carbon footprint on 4,000 demonstration farms. Within this sample, 60 innovative low carbon dairy farms were also selected to demonstrate their environmental efficiency and test new mitigation techniques. At the end of the project, a new evaluation of the milk carbon footprint will be done with CAP'2ER on these farms to determine the reduction in GHG emissions. This approach will enable partners to develop a 'climate roadmap' of milk production based on environmental objectives, while ensuring its acceptability by farmers and without compromising the technical, economic and social sustainability of dairy production systems.

Co-benefits and trade-offs

The LIFE CARBON DAIRY action plan integrates GHG emissions and carbon footprint calculations into the practices implemented on French dairy farms. Measures to reduce GHG emissions and increase soil carbon are strongly linked to reducing water and air pollution, improving soil health and enhancing biodiversity. In this way, the plan seeks to avoid the transfer of pollution and to maintain ecosystem services (e.g. plant diversity, pollination etc).

By reducing GHG emissions, the LIFE CARBON DAIRY action plan will also help improve farm efficiency and sustainability. A lot of mitigation practices induce savings and less working time for farmers, for example by reducing energy consumption and use of inputs (e.g. feed, fertilizers), or by increasing livestock grazing time. However, in some situations, implementation of the action plan may require additional investment (e.g. equipment purchases, investment in infrastructure and buildings, or more working time) at direct cost to the farmer. Economic indicators included in the advisory tools allow farmers to link the economic benefit/cost to the environmental benefit and determine the benefit/cost in €/kg CO_2 eq avoided. Carbon credit mechanisms may also be incorporated in the future in order to compensate for any negative economic effects.

Implications for adaptation

Climate change affects ecosystems (increase in the atmospheric concentration of CO_2 and nitrogen, atmospheric deposition of nitrogen, species introduction etc) and agricultural practices (summer feeding, spring and autumn grazing). The sustainability of livestock farming systems is reliant on taking into account the effects of climate change. Although the LIFE CARBON DAIRY action plan is aimed at mitigating GHG emissions, its mitigation strategies have been designed to take into account a changing climate. This includes the impact of climate change on the evolution of grazing periods, impact of carbon in soils, use of buildings in summer, shifting cultivation cycles etc so as to increase the resilience of dairy production systems.

Challenges to implementation and adoption

The LIFE CARBON DAIRY action plan is intended to be the means by which the French dairy sector can continue achieving reductions in emissions intensity. However, implementing innovative mitigation practices on farms is not without potential technical and economic risks. The challenge will be to train farm advisers in providing appropriate advice and in promoting innovative techniques adapted to different operating environments.

To be sure of the adoption of practices, farms will be monitored throughout the duration of the program (5 years), and several times each year the advisor will support the livestock farmer and analyze practices implemented and practices not adopted. If necessary, depending on weather conditions, technical and economic circumstances, the advisor will adjust the action plan in conjunction with the farmer. The LIFE CARBON DAIRY action plan also creates farmer networks that will help producers understand the constraints and advantages of the implementation of innovative practices in different production contexts, including the part of grass and silage in the system, and agronomic and climate condition in regions.

Over time, it is anticipated that 2,000-3,000 more farms will implement the LIFE CARBON DAIRY action plan each year, and that CAP'2ER, the tool developed to assess carbon footprints at the farm level, will also be used at the national scale.

Further information

French carbon dairy action plan:
http://www.carbon-dairy.fr/

French Livestock Institute - Institut de l'Elevage:
http://idele.fr/

CNIEL (French Dairy Board):
http://www.maison-du-lait.com/fr/les-organisations/cniel

FCEL:
http://www.france-conseil-elevage.fr/

APCA:
http://www.chambres-agriculture.fr/

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140 000 tons CO_2 avoided