

# VistaMilk — precision dairying from soil to society

**Eimear Ferguson, Guillaume Le Palud and Francis Kearney**

*Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork*

## Summary

- VistaMilk aims to be a world leader in fundamental and translational research for precision pasture-based dairying.
- The research program will include the areas of soil and pasture, cow and food.
- The opportunities that arise at the interface between Agri-Food and technology will be the basis for the competitive advantage and international reputation of the centre.

## Introduction

Globally, agriculture is undergoing disruptions arising from the competing challenges of food security and increasing societal demands. The dairy sector is not exempt from this disruption as it faces a confluence of challenges including: (a) the rapidly increasing global demand for dairy products, (b) the growing concern over the impact of agriculture on climate change and water quality, and (c) the long-term volatility of global dairy markets. Fortunately, solutions to these challenges are emerging from a parallel revolution in smart and precision agriculture. For Ireland, this disruption presents major threats and opportunities as traditional dairy production needs to quickly transform itself using these new technologies.

## Centre profile and vision

The VistaMilk SFI Research Centre aims to be an agent of growth for the Irish dairy industry by being a world leader in fundamental and translational research for precision pasture-based dairying. VistaMilk represents a unique collaboration between Agri-Food and Information and communication technologies (ICT) research institutes and leading Irish/multinational food and ICT companies. The centre is hosted by Teagasc, in partnership with the Irish Cattle Breeding Federation (ICBF), Tyndall National Institute, the Telecommunications Software & Systems Group (TSSG), and the Insight Centre for Data Analytics. VistaMilk's vision is to be a world leader in the Agri-Food technology sector through innovation and enhanced sustainability across the dairy supply chain, positively impacting the environment, animal well-being and the health of consumers. This will be achieved by greatly improving the soil to gut supply chain connectivity.

## Research Program

To advance the state-of-the-art in Agri-Food and information sciences, VistaMilk has divided the problem domain into: (i) soil & pasture, (ii) cow, and (iii) food. Combined, these three areas cover the entire supply chain from soil to society. Within each of these areas, the centre has several Targeted Projects each of which will leverage the combined expertise of the VistaMilk partners. Each targeted project involves at least one industry partner.

The VistaMilk research program will particularly address:

- **Soil & Pasture:** Knowledge and tools to sustainably grow a greater quantity of higher quality herbage consistently for consumption by grazing cows.
- **Cow:** Achieving a greater volume of higher quality milk consistently through scientifically-supported optimised management and breeding strategies.
- **Food:** Develop higher value-add dairy products for human consumption, optimised for the predicted milk supply and quality based on predicted grass growth profiles and cow performance from earlier projects.

In addressing these areas, VistaMilk will combine biological sciences with cutting edge ICT:

- **Sensors:** The development of robust highly sensitive sensor infrastructure based on;
  - » (i) nano-electrochemical,
  - » (ii) spectroscopic and/or
  - » (iii) mechanical sensors integrated with control electronics, firmware, edge computing data analytics and data communications.
- **Communications & Networks:** The development of efficient and reliable end-to-end communication protocols for transporting information from various sensors all the way to the fog and cloud computing infrastructure.
- **Data & Data Analytics:** The development and application of machine learning and statistical modelling techniques, across the dairy supply chain, to predict optimal outcomes for pasture, for cows, and eventually for food production.
- **Decision Support:** Develop and deploy modular-based decision-support resources informed by the multilevel data and associated analytics for use by producers in the pursuit of consistently better performance.

## Conclusions

The VistaMilk SFI research centre will consist of >200 research scientists across >40 research and commercial partners. The opportunities that arise at the interface between Agri-Food and ICT will be the basis for the competitive advantage and international reputation of the centre. VistaMilk looks forward to progressing many new advances that will be of benefit to farmers and the industry nationally and internationally.



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excellence

Industry  
focused

Visionary



**VistaMilk**

Cohesive

Co-creative  
Co-productive

Innovative

Leaders

Building  
capabilities