Love food, love science

Research for the real world

Teagasc

Agriculture and Food Development Authority

Reducing antimicrobial resistance

Antimicrobial resistance (AMR) is the ability of bacteria to resist the effects of an antibiotic or other antimicrobial to treat disease and is one of the leading health concerns in human and veterinary medicine worldwide. Antimicrobial resistance is a global problem in both human and animal health.

A Teagasc team has studied antimicrobial drug usage in calves on commercial beef and dairy farms in Ireland. Due to this study researchers have been able to produce a list of actions farmers can take to minimise the animal's resistance to antibiotics such as improving biosecurity on farms to prevent infections through improved hygiene and animal welfare.

Bernadette Earley, a researcher in Teagasc says:

"Ireland's 'National Action Plan on Antimicrobial Resistance 2017-2020' recognises the urgent and growing problem of antimicrobial resistance for human health worldwide. It aims to implement policies and actions to prevent, monitor and combat AMR across the health, agricultural and environmental sectors".

Understanding obstacles on transferring the family farm

The low levels of land transfer from parents to their children currently experienced in Ireland indicate that a clear disconnect exists between the younger generation's readiness to begin their career in farming, and their parents' lack of preparedness to hand over the farm.

The sheer number of family farms, their combined impact on the agrifood industry, and the potential economic and social losses that may occur needed to be addressed.

Due to this, Teagasc has organised a series of nationwide 'transferring the family farm' clinics to facilitate the farm transfer process.

Anne Kinsella, an economist with Teagasc says:

"Teagasc have created a guide to transferring the family farm. This contains practical advice to assist farm families on the many issues associated with farm transfers and inheritance."

Benefits of grass fed cows

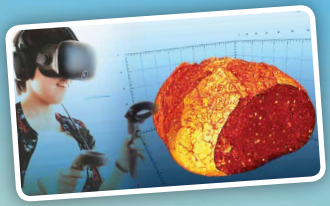
Ireland's temperate climate and plentiful rainfall makes ideal grass-growing conditions and allows us to keep cows on grass for up to 300 days a year. Consumers are increasingly interested in including more natural ingredients into their diet. Researchers at Teagasc have been looking at the benefits of products produced from cows raised on a diet of mainly grass.

The research has shown an increase in high-quality protein and the fatty acids omega-3, vaccenic and conjugated linoleic acid (CLA) levels in dairy products from cows on a grass-based diet, which are essential for human health and nutrition. Beta-carotene in grass-fed milk gives Irish butter its distinctive yellow colour.

Tom O Callaghan a researcher at Teagasc Moorepark explains:

"Consumer panels of the butter and Cheddar cheese produced with milk from these cows found that they scored very highly for colour, appearance and flavour".

Getting inside your food



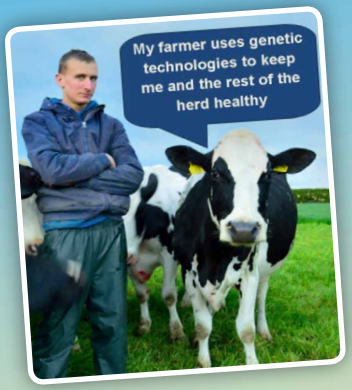
Combining Virtual Reality (VR) and Augmented Reality (AR) has the potential to revolutionise research for the visualisation of internal structures in food.

Using the latest image analysis software, adapted from the medical sector, researchers are now able to create a 3D visualisation of the inside of foods.

AR and VR can transform our understanding of the link between sensory parameters, such as texture and taste, and the physics of food structure, which will potentially lead to new manufacturing practices, food products and customer experiences.

Eimear Gallagher, Head of Food Quality and Sensory Science at Teagasc says:

"These technologies allow us to 'get inside bread' to visualise internal structures in 4D".



Unravelling the genetics of animal health

Ever wonder why some people never get sick, but others always do?

The genetic make-up of individuals is partly responsible. Genetics is the study of how traits, such as hair colour, eye colour, or even disease, is passed on from parents to offspring.

Researchers at Teagasc, Moorepark have investigated the genetic variability among cattle for health traits. Analysis has revealed that the genetic make-up of cattle is a major component of the animal health puzzle.

The findings from this research can help farmers identify cattle that are more likely to become sick in their lifetime, so preventative strategies, such as vaccination can be implemented.

Soil microbiology

Soil microbiology is the scientific discipline that is concerned with the study of all biological aspects of the microorganisms (such as bacteria, archaea, viruses, fungi and protozoa) that exist in the soil environment.

Microorganisms were the first life forms; they existed billions of years before all other organisms. Their extraordinary diversity enables them to carry out key processes essential for the functioning of the planet and the maintenance of life.

Teagasc conducts a wide range of research into soil and environmental microbiology to contribute to the growth of crops and the overall health of the soil ecosystem.

Fiona Brennan, a researcher at Teagasc explains:

"Studying soil microbes in agricultural systems is important to enable us to contribute towards meeting the global challenges of food security and climate change, and ultimately marrying environmental and agronomic sustainability".

Monitoring forests from space

Teagasc has developed a new piece of software called 'IForDEO' that uses satellite images to automatically detect forest disturbance. Its aim is to improve Ireland's reporting of greenhouse gas emissions and to build a system to monitor forestry disturbance from space such as fire and destruction to animal habitats.

After carbon dioxide is converted into organic matter by photosynthesis, carbon is stored in forests for a period of time in a variety of forms before it is ultimately returned to the atmosphere through respiration and decomposition or disturbance. Any disturbance of forestry is important (whether planned like felling or thinning, or unplanned like storm damage), as the events can possibly alter the carbon stored in the forest soils.

Stuart Green, a researcher at Teagasc explains:

"Significant work was put into creating a long-term archive of imagery from a number of satellite receiving stations across Europe, to create the historical image archive existing for the island of Ireland".

The quest for the perfect crisp

Potatoes are the 4th most important crop in the world.

Ireland's average annual potato consumption is 85kg per person, (2½ times higher than the world average).

Over 30 varieties of potato have been created at Teagasc in Carlow including the famous "Rooster" potato.

Researchers at Teagasc are working on new varieties for the production of perfect chips and crisps.

One of the aims of the breeding programme in Teagasc Oak Park is to develop potato varieties that give the crisp its golden colour.

Fergus Meade, a Post-Doctoral researcher at Teagasc Oak Park explains:

"All of this information gets fed into a computer model, which we are improving each year. We hope that will help us to predict fry colour in the future".

Walsh Fellowships Programme

The Teagasc Walsh Fellowships Programme provides a stipend and contribution to fees to postgraduates on projects relevant to the Teagasc Research and Knowledge Transfer Programmes while studying for a higher degree (Masters or PhD level) in collaboration with Universities and Institutes.

The benefits of the programme include:

- Chance to develop skills and learn from internationally renowned scientists and participate in conferences and events.
- Opportunity to travel overseas.
- Experience the frontline of agriculture and food scientific research.
- Many former Teagasc Walsh Fellows continue their careers in Teagasc and many others are in key positions in universities, public services, agri-food companies and financial institutions at home and abroad.

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Careers
at Teagasc

Do you want to work on the cutting edge of agricultural and food research?

From careers in microbiology to biotechnology, the ever increasing use of technology not only in our own lives but in agriculture also, leads to a constant need for scientists and researchers in the field of agriculture and food.

At Teagasc we have four main research programmes:

- Animal and Grassland Research & Innovation Programme
- Crops, Environment and Land Use Programme
- Food Programme
- Rural Economy and Development Programme

Visit www.teagasc.ie for more information and to sign up for job alerts.

Unleash your potential

Love food, love science. Research for the real world

pack created by Catriona Boyle and Philip Evans, Teagasc.

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