



## RHASS Presidents' Initiative for 2023

The RHASS Presidents' Initiative for 2023 will raise awareness of the critical role science plays in our food and drink sector.

### CASE STUDY:

## Scientific partnership focuses on water quality and animal health



# Moredun

### Case Study Partner

Moredun is committed to promoting livestock health and welfare through research and education and is recognised worldwide for its contribution to research into infectious diseases of farmed livestock.

Established by Scottish farmers in 1920, Moredun's work has always been firmly based on addressing the needs of the farming industry.

Moredun's research has led to the development of many vaccines, diagnostic tests and improved treatment strategies for farm animals across the globe.



**"I have always been interested in livestock production and the prevention of diseases on farm."**

Beth Wells, Moredun

### Overview

High incidence of the zoonotic parasite, *Cryptosporidium parvum*, were detected in Glenlivet, and in particular in the neighbouring water supply at Tomnavoulin, which cattle, sheep and red deer were able to access for drinking water.

After a series of samples were taken by the Moredun Research Institute, from different farms in the region to identify the scale of the problem, steps were identified, in collaboration with Scottish Water, to encourage farmers to employ stricter

management protocols to reduce the risk of transmission from livestock in to water sources and to investigate land management solutions.

was a known issue with farmers suffering from high incidences of neo natal calf disease." Intensive farming and cross contamination within herds was one part of the problem and with herds having direct access

**"We wanted to explore ways to improve animal health and productivity for farmers."**

management protocols to reduce the risk of transmission from livestock in to water sources and to investigate land management solutions.

Beth Wells led the project on behalf of Moredun and explained why she got involved: "I have always been interested in livestock production and the prevention of diseases on farm and in the Glenlivet area, there

to burns, this led to high levels of Crypto making its way into neighbouring water courses.

"We wanted to explore ways to improve animal health and productivity for farmers and we discovered that key to that, would be getting on top of high Cryptosporidiosis rates, which in turn would lead to better water quality in the region."



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This case study is one in a series, highlighting where farmers, across a range of different sectors, have benefited from scientific advancements.

## Cryptosporidiosis research

At that time, Moredun was working on techniques for the water industry to detect various pathogens, including Cryptosporidium spp, in order to improve detection.

They collected and analysed samples from four different farms in the catchment surrounding the Tomnavoulin water supply. "To take pressure off individual farmers, we took a whole catchment approach," explained Beth,

"covering a number of farms and extending our samples to red deer, who were found to graze alongside livestock in the region and farmers reckoned they were a big part of the problem.

"We produced an anonymous report and organised a farm event to bring together local farmers, vets and land managers to discuss the issue and how we could better work together to reduce transmission rates on-farm."

## Reducing disease transmission

She explained that this involved looking at areas such as calf hygiene, as well as land management techniques such as improving riverbanks and riparian planting, which not only helped with water quality, but provide habitats for local wildlife.

"We applied for payments for ecosystem services such as funding for fencing and we were

able to fence off animals from water sources and install water troughs. We found that these measures along with simple biosecurity steps such as using the correct disinfectant and regularly changing bedding between calves, reduced Cryptosporidiosis rates, which led to better efficiency for farmers and better overall animal health."

**"When this was published in 2018, this equated to a reduction in value of £130 per affected calf."**

## Calf efficiency gains

Data gathered at the time found that the mean weight difference at six months old between calves which had clinical Cryptosporidiosis in the first month of life, compared to calves which had not, was 34kg.

When this was published in 2018, this equated to a reduction in value of £130 per affected calf, which doesn't include the additional labour, veterinary and treatment costs in caring for sick calves.



## Protecting watercourses

Microbiologist James Green led the laboratory team at Scottish Water and worked closely with Beth and Moredun to look at ways to engage with farmers to help protect water courses.

Crypto detections were a regular occurrence in raw samples taken at Tomnavoulin. A significant detection in treated drinking water in 2013 led to boil water restrictions and the use of bottled water for consumers on the Tomnavoulin supply. But In 2014, levels peaked, when James and his team found 73

positive samples, prompting Scottish Water to invest in better management practices.

Since working closely with various stakeholders, only two Crypto detections were found in raw samples in 2022.

“Our key driver for this project was to improve the quality of water courses and reduce the risk of disease transmission to public health. If we can ensure high quality water is coming in at the source, then it is easier to treat and doesn’t require as much energy use or generate as much waste - which is a win-win for all.

## Working with farmers

“We have a dedicated sustainable land management team who focus on working alongside landowners and farmers, to improve the way they use the land to minimise the impact on drinking water quality.

“With the Glenlivet project, this

involved getting farmers to fence off watercourses travelling through their land and looking at improving things like moorland and peatland areas, to help control flow of water to reduce the microbial load ending up in streams.

## Reducing energy costs

“Our efforts are focused on improving water at the source, as it is better than throwing money at the treatment process, which requires buying in chemicals or running pumps, relying on high energy demands, especially when energy prices are high, and we are striving to lower our carbon footprint.

“Since working alongside farmers and Moredun, plus other stakeholders in the region, we have seen a giant reduction in *Cryptosporidium* spp detections at Tomnavoulin, which is not only great news for water quality but it has had a domino effect on improving efficiency for farmers, supporting local wildlife and biodiversity and reducing our carbon footprint.”

