AI Assisted Animal Biosecurity Advice Tool

Project report

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Overview

An online tool is being developed using artificial intelligence to provide convenient access to biosecurity advice for farmers. Initial development and testing of the proof of concept has produced a shiny app

Available at: https://epidemiology.sruc.ac.uk/shiny/apps/bitesize-biosecurity/

Main Findings

The AI Assisted Animal Biosecurity Advice Tool developed in this project combines the use of a Large Language Models (LLM) with expertise from farmers, vets, and livestock advisors to produce summarised information about biosecurity that is convenient, easy to access, and tailored to the needs of farmers in different contexts.

- It is possible to use LLMs to summarise biosecurity advice from a curated range of sources.
- Artificial intelligence can present work in 'farmer friendly' language.
- A tool which draws from expertise and input from farmers, vets and livestock advisors can help biosecurity advice to be summarised in an accessible and convenient format.
- This tool will be further developed to draw elements of generic biosecurity advice for specific farming contexts.

Artificial intelligence (AI) can be harnessed to summarise curated sources of biosecurity advice into a format and using language that is accessible and 'farmer friendly'. This tool will support farmers to reduce risk and manage disease in their livestock.

This research was undertaken with support from SEFARI Gateway's Innovative and Knowledge Exchange Fund and will be further developed within the Scottish Government Rural Affairs and the Environment Portfolio Strategic Research Programme 2022-2027, Programme A, Theme 2, Project **Achieving Improvements In The Health Of Scottish Livestock Through Increased Uptake Of Biosecurity Practices.** For more information please see: https://sefari.scot/about-us/strategic-research-programme

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Introduction

Publicly available livestock biosecurity advice tends to be general, i.e. it does not relate to specific farm contexts, and it is usually provided on a disease-by-disease basis. It can also be complex and wordy. This can result in lower uptake by farmers who might dismiss advice for diseases for which they do not perceive their stock to be at risk, when they think that it doesn't fit with their production system or setting, or when they have neither the time nor inclination to search for biosecurity advice and read it.

Methods

- Expertise from colleagues within SRUC, Moredun and outwith was harnessed to confirm and add to the selection of biosecurity advice sources which was curated for the project.
- An LLM was used to summarise the curated information for a selection of animal types and diseases.
- Several iterations of prompt engineering (the method of strategically designing input instructions) were used to optimise and adjust desired output from the LLM.
- AI Assisted Animal Biosecurity Advice Search Tool was built using a shiny app platform. Input and expertise from farmers, vets and advisors was collected to (a) add views and examples about biosecurity practices in different production types, farm settings, and with different ruminant species and (b) provide feedback and ideas for content and features of the Biosecurity Advice Search tool.

Future Development

- We will further explore how the tool can be expanded, scaled up, sustainably managed, and disseminated to the farming community.
- It will be incorporated into a not-for-profit Bitesize Biosecurity app.

Policy Implications

LLMs can be used to summarise information into numerous output formats. This could assist with disseminating biosecurity/policy to a wide range of audiences.

Careful curation of sources, prior to the use of the LLM was crucial in ensuring the information provide was scientifically valid.

Industry Implications

A webinar was held on 26th March 2025 Available at: https://youtu.be/qdVmtbZsRDI . To ensure this tool works well for the industry and is effective in helping to reduce risk of disease on their farms, we will engage with farmers throughout development to ensure the language and content fit with their priorities and preferences.

For more information on this work, please contact:

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