TEAGASC PHD WALSH SCHOLARSHIP OPPORTUNITY

"Characterisation of the air microbiome in dairy-to-beef calf housing and its association with the respiratory health of calves"

Walsh Scholarships Ref Number 2024047

Background

Bovine respiratory disease (BRD) is a key cause of morbidity and mortality in dairy to beef calves. It is diagnosed in 33.4% of calves aged between 1 and 5 months submitted to regional veterinary laboratories. In work conducted by Earley et al. (2019) BRD was the second most common reason for treatment of calves during the preweaning period. BRD is caused by numerous viruses and bacterial agents. BRD has a complex aetiology which is still an area of developing knowledge.

The respiratory tract of calves is not sterile, it is populated with various microorganisms. Some of the commensal microorganisms identified in the respiratory tract of calves are potential pathogens. A key part of our developing our understanding of BRD is understanding how these microorganism transition from commensals to pathogens. This is likely to be influenced by numerous factors such as stress and poor air quality. One key area that has not been investigated is the influence that the microorganism present in the air of calf housing have on the microbiome of a calf's respiratory tract. Air is also hypothesized as a medium for transmission of BRD pathogens however its relative importance is not well established. No published work has attempted to sequence the air of calf housing, this is likely to provide key information around pathogen transmission and the specific characteristics of poor air quality that might be associated with increased risk of BRD.

Rapid identification of diseased calves and appropriate treatment is vital to achieving satisfactory resolution of BRD cases. One of the key barriers to effective treatment of BRD is antimicrobial resistance however the current susceptibility of BRD pathogens present in Ireland is unknown, developing a knowledge of the current trends in antimicrobial resistance will allow Irish veterinarians to better plan testing and treatment protocols.

Overall, this project aims to improve our understanding of the dynamics of the air microbiome in calf housing and how it affects the prevalence and severity of BRD.

i. Examination of the air microbiome in dairy calf to beef housing; longitudinal trends, investigation of housing microclimates and influence of other housing environmental factors
ii. Investigation of the influence of air microbiome on the microbiome of the respiratory tract and health of dairy to beef calves
iii. Examination of the virome present in dairy to beef calf housing air
iv. Survey of antimicrobial resistance genes present in bacteria identified in the respiratory tract of dairy to beef calves

Requirements

Applications are invited from graduates holding or expecting a primary degree (First or Upper Second Class Honours) in a biological science (e.g., Agricultural Science, Animal Science, Biology, Genetics, Veterinary Science). The successful candidate will be expected to register with the School of Veterinary Medicine, University College Dublin for a 4-year Ph.D. degree. The successful candidate should be highly self-motivated and be prepared for periods of field and laboratory work, and engage in training and development courses. A full driving licence is required. For applicants whose first language is not English, requirements are outlined here.

Award

Funding will be awarded to the student who will complete the scholarship. The current rate is a stipend of €25,000 per annum, plus a contribution to fees up to a maximum of €6,000 per annum. Any fees in excess of this amount will be addressed by the HEI. The successful candidate will be mainly based at the Animal & Grassland Research and Innovation Centre (AGRIC), Teagasc Grange, Dunsany, Co. Meath, and will be registered at UCD. The research will be collaborative, involving scientists at University College Dublin, Teagasc, Animal and Grassland Research and Innovation Centre, Grange, Co.

Meath, Dublin City University and University of Ghent. The scholarship will start on Monday 9th September 2024.

Further Information

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Dr. Conor McAloon, University College Dublin, School of Veterinary Medicine, Veterinary Science Centre Belfield Dublin 4. Phone: +353 (0)1 716 6083, email: Conor.McAloon@ucd.ie

Application Procedure

A letter of interest together with a curriculum vitae and the names and contact details of two referees should be sent by email to john.donlon@teagasc.ie and Conor.McAloon@ucd.ie

Closing date for receipt of applications: 22 July 2024