

# Detection of immunity in sheep following anti-rabies vaccination

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**Purpose:** Rabies is a fatal but preventable disease with proper pre-exposure anti-rabies vaccination (ARV). Dogs, as household pets and strays, are the reservoir and vector of the disease, and dog bites have been associated with human rabies cases in Sri Lanka over the past few years. However, other susceptible species having frequent contact with humans may be a source of infection. One such species is sheep and immunity following ARV has never been tested in sheep reared in Sri Lanka.

**Materials and Methods:** We have tested serum samples from sheep reared in the Animal Centre, Medical Research Institute of Sri Lanka for the presence of anti-rabies antibodies following ARV. Sheep serum samples were tested with Bio-Pro Rabies enzyme-linked immunosorbent assay (ELISA) antibody kits used for the first time in Sri Lanka and our results were verified by a seroneutralization method on cells (fluorescent antibody virus neutralization, FAVN test) currently recommended by World Organization for Animal Health and World Health Organization.

**Results:** Sheep received annual ARV and maintained high neutralizing antibody titers in their serum. No maternal antibodies were detected in lamb around 6 months of age. Agreement between the ELISA and FAVN test, i.e., coefficient concordance was 83.87%.

**Conclusion:** Annual vaccination in sheep has an effect on maintaining adequate protection against rabies by measurements of anti-rabies antibody response. Lambs need to be vaccinated earlier than 6 months of age to achieve protective levels of neutralizing antibodies in their serum. Introducing this ELISA in Sri Lanka will be a good opportunity to determine the level of anti-rabies antibodies in animal serum samples.

**Keywords:** Sheep, Rabies vaccination, Enzyme-linked immunosorbent assay, Fluorescent antibody virus neutralization test, Rabies antibodies

## Introduction

Rabies, a viral zoonotic disease that affects human and mammals, which cause acute progressive encephalitis. An estimate of 59,000 human deaths occur annually, with over 3.7 million disability-adjusted life years due to rabies [1]. In Sri Lanka, the rabies virus is being maintained in the dog population (*Canis lupus familiaris*) and 20–30 human deaths are reported annually due to rabies [2]. The source of infection in human rabies cases has mostly been household pets and stray dogs [3]. Other susceptible mammalian species exposed to infected dogs can also transmit the rabies virus, one of which is the sheep (*Ovis aries*), which has close contact with humans.