

Delayed-Type Hypersensitivity (DTH) Testing in Cattle (assessing cell-mediated responses)

Category

3. Minor conscious intervention

Objective

DTH testing aims to assess the immune capacity of animals as a proxy for general disease resistance. Testing usually coincides with weaning or transitioning of animals into feedlot systems so that the immune competence of animals can be tested when under the influence of management-induced stress. The process is minimally invasive to the animal.

Alternatives to animal use

No alternative to animals, as *in-vivo* immune response needs to be measured.

Equipment

- Saline + insulin syringes + vaccine + vaccine gun + needles + vaccine pouch + ice bricks
- Alcohol swabs
- Calipers x 2 + record sheets + pens + clip board
- Paper towel + soap + sunscreen + hat + overalls + gum boots

Safety and Risk considerations

Animal injury whilst in crush

Injury to staff performing procedure – e.g. kick from animal, self-injection of vaccine

Allergic reaction to vaccination

Infection at injection site

Drugs, chemicals or biological agents

7in1 vaccination (Ultravac 7in1, Zoetis) administered

Procedure

Day 0 of Study

1. On day 0 of the study, the animal will be removed from their holding pens and transferred to crush for adequate restraint for vaccination.
2. The animal will be vaccinated with 7in1 vaccination (Ultravac 7in1, Zoetis).
3. The animal will be returned back to their holding pen.

DTH Testing Procedure – Day to be performed is to be determined by the study design

1. On the designated study design day, animals will be removed from their holding pens and transferred to crush for adequate restraint for procedure



2. The skin thickness of the caudal tail fold will be measured bilaterally on the animal PRIOR to intradermal injections and recorded. Three (3) measurements of each side will be taken and averaged to ensure consistency in measurement.
3. The chosen injection sites will be cleaned with an alcohol swab prior to injection
4. 0.1mL of sterile saline will be injected intradermally using a 30gauge insulin syringe on one side of the caudal tail fold.
5. Prior to injection of 7in1 vaccination (Ultravac 7in1, Zoetis), the vaccination vial will undergo a “vaccination check” see appendix one (1).
6. 0.1mL of 7in1 vaccination (Ultravac 7in1, Zoetis), will be injected intradermally using a 30gauge insulin syringe on the alternate side of the caudal tail fold.
7. The animal will be returned to its holding pen and observed for thirty (30) minutes for any reaction.
8. 48hrs post intradermal injections, the animals will be removed from their holding pens and restrained back into the crush.
9. The injection sites will be inspected for any signs of infection.
10. The skin thickness at the caudal tail fold injection sites will be measured using calipers. Three (3) measurements of each side will be taken and averaged to ensure consistency in measurement. See appendix two (2).
11. Blood samples will be taken from the animal as per blood collection SOP (SOP065).
12. Once the measurements and blood samples are taken, the animal will be taken back to its holding pen.
13. The blood samples will be analysed via ELISA.

Impact on wellbeing of animals

The procedures described here are expected to have minimal impact on the wellbeing of the animal. The vaccination used is a commercially available vaccine that is readily used in cattle. Sterile physiological saline is being used which will have very minimal impact on animal.

The animal will experience minor discomfort during the intra-dermal injection procedure, however a 30gauge needle is being used to minimise the level of discomfort on the animal.

All handling and manoeuvring cattle will be undertaken with the utmost care to reduce as much stress as possible on the animal. The use of low stress handling and restraint techniques are necessary for this procedure.

Animal Care

The animal will be monitored for thirty (30) minutes post-vaccination to observe for any allergic reaction. If medical attention is required a licensed, registered veterinarian will be called for medical assistance.

Pain Relief

No pain relief is required for this procedure.

In the event of an emergency where veterinary assistance is required, pain relief may be administered upon veterinary instruction.

Reuse and repeated use

It cannot be repeated

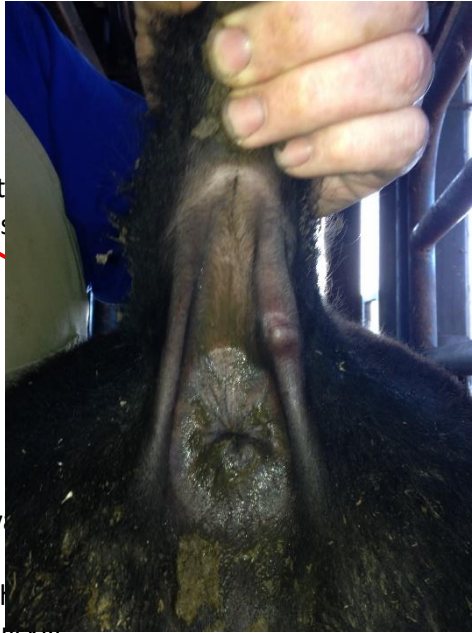
Qualification, experience or training necessary to perform procedure

This procedure can be performed by trained technicians, scientists and veterinary professionals. Training will need to be endorsed by competent professionals routinely performing this procedure.

References and relevant links

Appendix One

Appendix Two



Check sheet

1. When undertaking the vaccination of sheep for various purposes make sure the batch Number of each pack are the same.
2. Ensure that vaccine particles are resuspended before starting.
3. Ensure that the vaccine is well mixed during the vaccinating of animals. Settling will occur very quickly.
4. It is important to keep the vaccine cool while vaccinating and to keep an eye on gun settings to ensure animals are receiving correct dose volume each time.
5. When stopping for a break it is very important to drain the vaccine from the tube back into the pack (simply remove the tube from end of gun just enough to allow vaccine to drain into pack before immediately re-attaching tube). With pack upright (ie. not drawing vaccine from pack into tube) empty contents of gun by squirting onto the ground. Keep vaccine cool while on a break.



6. Vaccine can be used for 30 days after opening providing correct storage instructions are followed. Store at 2°C to 8°C (Refrigerate. Do Not Freeze). However this should be avoided if at all possible and a new pack opened at the start of each day. If unavoidable, on each subsequent reuse, swab the opening with a suitable disinfectant (for example, methylated spirits) both before and after using. A sterile needle must be used each time product is removed.
7. Store unopened material upright, at 2°C to 8°C (refrigerated) and in the original cardboard packaging to protect from light.

The left-hand side with intradermal saline injections vs the right-hand side with 7in1 vaccine intradermal injection. The site of injection is measured with calipers and recorded.