

# 5-in-1 clostridial vaccination of alpacas

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## Background

5-in-1 vaccine protects against 5 different but related bacteria known collectively as clostridial diseases. These bacteria can cause sudden death in your alpacas. They are identified individually as:

1. **Tetanus** (*Clostridium tetani*) – animals often found dead soon after shearing/castration/dog bite wounds/where inadequate disinfection of castration equipment used or castration performed in unhygienic conditions (dirty yards, wet weather).
2. **Pulpy kidney/enterotoxaemia** (*Clostridium perfringens* Type D) – sudden death in multiple livestock being fed large quantities of highly digestible carbohydrate (think lush pastures, cereal grain and cereal grain-based pellets). Often affects the largest weaners in a mob.
3. **Black leg** (*Clostridium chauvoei*) – caused by infection of wounds from shearing cuts/rough handling in yards/females following difficult birth/navel infection soon after birth/castration. Infection causes local inflammation (red and swollen tissue), gas under the skin, blood poisoning and rapid death.
4. **Black's disease/infectious necrotic hepatitis** (*Clostridium novyi* Type B) – spores lie dormant in the liver and can be activated by migrating liver fluke, leading to toxin production and sudden death.
5. **Malignant oedema** (*Clostridium novyi* Type A, *Clostridium sordelli*, *Clostridium septicum*, *Clostridium chauvoei*) – often associated with fighting/infected wounds from shearing/castration/difficult birth/dog bites, leading to blood poisoning and death.

The bacteria are often concentrated around stock yards and in and around dung piles, and their spores can survive in soil for many years.

## How does the vaccine work?

Efficacy of 5-in-1 vaccination relies on the administration of 2 doses of vaccine, injected under the skin, 4-6 weeks apart to produce active immunity. The *first dose* is known as the *priming*

*dose* and it stimulates the immune system of your alpaca to produce antibodies against the diseases in the vaccine. The *second dose* is known as the *booster dose* because after this second dose is given, the immune system recognises the recently given vaccine and produces more antibodies for a more prolonged time, as depicted in Figure 1.

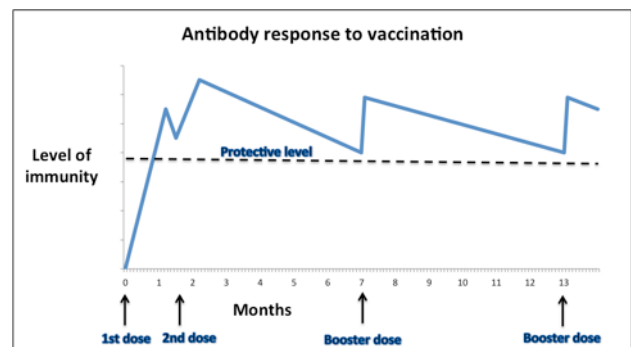


Figure 1. Antibody response to vaccination.

A booster dose *every 6 months* thereafter is required to maintain a protective level of antibodies in your alpacas (compared with sheep and cattle where they are only boosted annually). Timing of injection of this *twice yearly booster* in your females should include a booster 4-6 weeks prior to parturition, so that antibodies produced by the female enter the first milk or colostrum, and are drunk by the neonate in the first 12 hours of life. The antibodies are absorbed across the gut wall, enter the blood stream and circulate around the body, thus providing protection to the cria against clostridial diseases for approximately 8-12 weeks. This is known as passive immunity because the neonate did not make the antibodies itself.

## How to use the vaccine?

Read the instructions that come with the 5-in-1 vaccine and look after the vaccine so it maintains its efficacy. Take an esky and cold brick with you when you buy the vaccine so you can keep it cool and out of direct sunlight after purchase *en route* to placing it in the fridge when you get home. On the day/s of use, carry the vaccine in an esky containing a cold brick to the yards and place the vaccine back in the esky during breaks such as lunch to maximise life and efficacy of the vaccine. At the end of the day, remember to put the vaccine back in the fridge and not leave the vaccine pack/s hooked on a nail in the woolshed or rattling around in the back of your vehicle. Write the date you opened the vaccine on the plastic container. Vaccine should ideally be discarded 30 days after opening. Vaccine that was opened last season should not be used this season!

Shake vaccine container well before use. If you are only injecting a few livestock, you can use a needle and syringe to draw up the vaccine. Swab the rubber bung with alcohol before inserting the needle. Remove air bubbles from the syringe so each animal gets the correct dose. If you leave the needle in the top of the vaccine container for filling multiple syringes, place plastic vaccine pack upright (so it does not leak!) in the esky between uses to keep dust out of the needle hub. Do not leave container with needle in it sitting up on a fence post in the sun. Otherwise, use a clean vaccinator gun with a new needle at the start of each day. Replace the needle when it gets blunt. Avoid getting air bubbles in the line/syringe so all livestock get the appropriate dose. The appropriate volume of vaccine to administer varies according to manufacturer so read the label carefully. Alpacas should be given a sheep dose if not specified on the label. Alpaca owners need to be aware that few vaccines are registered for use in alpacas. Consult your local veterinarian for advice on vaccine use in alpacas on your farm.

Vaccine should be injected *under the skin* (subcutaneously), NOT into the muscle (intramuscularly). To facilitate this, use short needles. Insert the needle at a shallow angle at the base of the neck in front of the shoulder blade where there is loose skin on the side of the neck (Figure 2). Do not inject too close to the dorsal midline to avoid the large ligament that supports the neck. Do not inject too close to the ventral midline to avoid the trachea and major nerves and blood vessels in that area. Do not pick up the skin with your other hand to avoid self-injection!

An alternative site for subcutaneous injection is in the hairless area on the lateral thorax, behind the elbow. This site is easier to access when fleece is short.



**Figure 2. Site of subcutaneous injection in alpacas in front of the shoulder blade.**

Avoid accidental mixing of different treatments, if administering other medications at the same time, by ensuring you use different sides of the neck. Injecting on the same side could lead to inactivation of the different products rendering them ineffective (and wasting the dollars you have just invested).

## When to vaccinate?

1. Crias should be vaccinated at 8 weeks to provide a priming dose, when the protection from mother's milk is starting to decline.
2. Crias should be vaccinated again 4-6 weeks later to provide a booster dose thus ensuring maximal effect of vaccine.
3. Pregnant females should be vaccinated 4-6 weeks pre-parturition to ensure high concentrations of clostridial antibodies in the colostrum.
4. Twice yearly vaccination of all stock prior to high-risk periods (e.g. start of grain feeding).
5. ANY new stock onto the property: Vaccinate twice, 4-6 weeks apart to ensure been boosted properly, then as per home-grown livestock.

## What's in 6-in-1, 7-in-1 and 8-in-1 vaccines?

*6-in-1 vaccine* is designed for use in sheep and goats and protects against the 5 clostridial diseases discussed above, and another bacterial disease known as cheesy gland/CLA/caseous lymphadenitis (*Corynebacterium ovis*). The organism is picked up by animals that have not been vaccinated, through shearing cuts/infected combs and cutters/dipping after shearing/close yarding. Infection leads to abscess formation in lymph nodes around the body and carcass condemnation at the meat works. Vaccinate alpacas:

- If your herd has a high prevalence of subcutaneous abscess formation
  - Under the direction of your veterinarian
  - According to manufacturers directions.
- If you have lice in your alpaca herd and are going to dip them off-shears, avoid dipping until shearing wounds have healed.

*7-in-1 vaccine* protects against the 5 clostridial diseases discussed above, and 2 types of leptospirosis. The latter 2 organisms can affect cattle, sheep, goats and alpacas and is spread by urine from infected animals contaminating pastures, water and feed. Humans can also be infected. Clinical signs of leptospirosis include abortions, reduced milk output, red urine, ill-thrift and may cause death. Speak to your veterinarian about using 7-in-1 vaccine in your alpaca herd.

*8-in-1 vaccine* protects against the 5 clostridial diseases discussed above and 3 others:

- *Clostridium perfringens* types B & C, which are associated with haemorrhagic enterotoxaemia
- *Clostridium haemolyticum*, which is associated with bacillary haemoglobinuria or "red water disease".

Speak to your veterinarian about using 8-in-1 vaccine in your alpaca herd.

## Summary

Vaccinating your stock correctly against clostridial diseases is a cheap and effective way to prevent many of the causes of sudden death in all ages of stock in your herd. It is imperative that livestock receive a booster dose 4-6 weeks after the priming injection, followed up by a twice-yearly booster timed appropriately (females 4-6 weeks before giving birth, other stock prior to going onto grain/pellet supplements).

Websites with more information on clostridial diseases include:

- <http://www.mla.com.au/Livestock-production/Animal-health-welfare-and-biosecurity/Diseases/Infectious/Clostridial-diseases>
- <http://www.mla.com.au/Livestock-production/Animal-health-welfare-and-biosecurity/Husbandry/Vaccinating>
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**USE GOOD HUSBANDRY TECHNIQUES. KEEP GOOD RECORDS. WRITE DOWN TREATMENTS/MATING DATES/MEAT WITHHOLDING TIMES.**

**NO PRODUCTS ARE REGISTERED FOR USE IN ALPACAS. CONSULT YOUR VETERINARIAN AND ALWAYS READ THE LABEL BEFORE USING ANY OF THE PRODUCTS MENTIONED. NEVER USE ANY PRODUCT IN ALPACAS THAT IS NOT REGISTERED FOR USE IN FOOD PRODUCING ANIMALS.**

**FOR ANY SIGNS OF UNUSUAL OR SERIOUS ANIMAL DISEASE, RING THE DISEASE WATCH HOTLINE: 1800 675 888.**



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