

Cattle Vaccination Information leaflet

Information leaflet for Irish farmers, advisors and vets



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BIOSECURITY CONTROL PROGRAMME

THIS GUIDE IS PART OF A SERIES OF LEAFLETS ON VARIOUS ASPECTS OF BIOSECURITY

1. Understanding Infectious Diseases
2. Bioexclusion: Keeping Infectious Diseases Out of Your Herd
3. Purchasing Stock: Reducing Disease Risks
4. Preventing Disease Spread within Your Farm – Biocontainment
5. Managing an infectious disease outbreak

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BIOSECURITY CONTROL PROGRAMME



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WHAT IS VACCINATION?

A vaccine is a substance which protects an animal against natural infection by a specific infectious agent. Often vaccines are made from weaker or 'killed' versions of an infectious agent (disease-causing bacteria, virus, fungus or parasite) or sometimes from a related organism with a similar, but not identical, genetic makeup to the disease-causing agent.

When a vaccine is introduced into an animal it stimulates the immune system. The animal's initial response includes production of antibodies (proteins). Over time, antibody levels may reduce in the absence of exposure. However, the animal's immune system remembers the exposure to the vaccine and when the animal comes into contact with the live infectious agent, the immune system responds quickly, and in most cases will provide sufficient protection so that the animal does not develop clinical signs.

ABOUT VACCINATION

Across a group of animals, there can be significant variation in the degree of immunity which natural exposure to disease causes in individuals.

When a group of animals is exposed to an infectious agent, they may become sick and then either succumb, or develop immunity. Some animals in the group may not have been exposed to the infectious agent and so remain susceptible to the particular disease.

Vaccines are an extremely useful tool to ensure that the majority of animals become immune to an infectious agent at a time that best suits management and before the risk of a disease outbreak, thereby avoiding the risks and losses associated with animals becoming sick and unproductive.

Satisfactory protection against disease is usually best achieved by using vaccines well in advance of likely disease exposure. Many vaccines require a primary course of two doses before protection is complete e.g. clostridial vaccines. However, some vaccines may be used in the face of a disease outbreak to decrease the severity of clinical signs e.g. live IBR marker vaccines administered intranasally.

Vaccines take time to provide a sufficient protective cover so ideally farmers should plan to use them well in advance of when their animals need protection. Some vaccines are not intended for use at the same time as other vaccines. Multiple vaccine use should be discussed with your veterinary practitioner on a case-by-case basis to determine whether this is appropriate.

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THE ROLE OF VACCINATION IN A FARM BIOSECURITY PLAN

In general, vaccination improves animal health by reducing the risk of clinical disease in a herd. If there are no risks of disease entry to a herd, or if the disease is not currently in the herd then there should be no need for vaccination. However even in the best managed herds, biosecurity may be compromised. Introduced carrier animals are the most likely way in which diseases are brought into a herd. Occasionally diseases may be introduced and animals may be exposed to infection through contact with infected sources from outside the farm such as vehicles, people and slurry. It is important to remember that vaccination is only part of an infectious disease control programme and cannot replace or offset insufficient attention to biosecurity. More information is available from the *Bioexclusion: Keeping Infectious Diseases Out of Your Herd* and *Preventing disease spread within your farm – biocontainment*.



Farmers who purchase or bring in animals (e.g. contract rearers) should consider establishing minimum biosecurity entry requirements for cattle moving onto their farm. Aside from establishing a knowledge of the disease status and testing history of the herd from which the animals are sourced, as well as potentially testing animals during the quarantine period after arrival, it is desirable to determine vaccination history of the brought-in animals.

In this regard, it is important to obtain specific information such as which vaccines were used and when they were administered. If killed vaccines were used, make sure that a complete primary course (commonly two doses given a few weeks apart) was administered. As a general rule, cattle should be appropriately vaccinated no later than two weeks prior to entering the farm (or at latest at the start of the quarantine period) in order to produce adequate immunity before the anticipated exposure.

TYPES OF VACCINES – LIVE/DEAD

Two vaccine types exist. Inactivated vaccines (also known as killed or dead vaccines) contain the disease organism or a toxin produced by the organism that has been inactivated during product manufacture. Inactivated vaccines invariably contain adjuvants, chemicals that are included in the vaccine to help the immune system to respond to these killed organism or toxoids. Killed vaccines often, though not always, require a two-dose primary course when given initially to kick-start protective immunity.

Live vaccines contain the live organism that is closely related to the disease-causing agent (virus, bacterium, fungus or parasite) though it is either a specially selected non-pathogenic strain, or agent that have been weakened or modified so that it can no longer cause disease. However, this change is not sufficient to interfere with their ability to induce immunity so that the animal is protected if it is subsequently exposed to the field strain of the disease-causing agent concerned.

Vaccines may be administered by injection (intramuscular or subcutaneous), by intranasal administration or orally. It is important to ensure that the vaccine is administered via the correct route and according to the manufacturer's directions.

VACCINE SOURCES

The sale and supply of vaccines is controlled by the legal category of the product concerned.

The product literature/package insert will identify which of three classes a vaccine belongs to:

1. POM (Prescription Only Medicine)

These vaccines can only be supplied on foot of a prescription from the supervising private veterinary practitioner (farm veterinary practitioner) for the farm.

2. POME (Prescription Only Medicine Exempt)

These vaccines can be supplied by the farm veterinary practitioner or by a pharmacist without a prescription.

3. LM (Licensed Merchant)

LM vaccines can be supplied by the farm veterinary practitioner, by a pharmacist from a pharmacy or by a licensed merchant from a registered premises.

It is important to only obtain vaccines from legitimate sources and they should never be purchased through internet sites of unknown reputation or from suppliers of unknown legal status. It is also important that purchased vaccines are licensed for use in the Republic of Ireland. This is verified by checking if the product carries a VPA (Veterinary Product Authorisation) number (or EU number for products licensed centrally at EU level). If in doubt, it is wise to consult the manufacturer or your veterinary practitioner.

VACCINE STORAGE

1. Observe the expiry date and storage information. Once opened, dispose of the remaining vaccine properly within the shelf-life stated on the package insert- usually only a few hours.
2. Keep refrigerators at the proper temperature to maintain vaccine effectiveness, usually between 2-8°C. Avoid freezing vaccines unless the label confirms this method of storage.
3. Protect vaccines from sunlight.

VACCINE ADMINISTRATION

WORKING WITH VACCINES

1. Read the label and/or package insert carefully before vaccinating animals. In particular check for possible side effects, contra indications, or warnings.
2. Check the dose, route and site of administration (under the skin, into the muscle or intra-nasal), age of animal, vaccinating against the correct disease, use in pregnancy, mixed with other vaccines or given on the same day.
3. Only use the vaccine in the species for which it is registered.
4. Give the proper dose in the appropriate clean area on the animal, using adequate restraint.
5. Do not insert a used needle back into an open bottle- always use a sterile needle.
6. Use disposable needles and replace between small batches of animals. Ideally replace after each animal. Do not reuse disposable syringes.
7. Where possible use an automatic vaccinator and ensure it is clean and correctly calibrated.
8. Check animals following vaccination for signs of unexpected changes in behaviour.
9. Live vaccines may come as two vials, one of liquid and one of powder which must be mixed before use. See package insert on reconstitution of the vaccine.
10. Use the transfer needle provided or a sterile needle to reconstitute live vaccines.
11. Give booster vaccinations at the intervals specified on the label or package insert.
12. Observe the licensed withdrawal periods.



Avoid performing several stressful procedures (moving pens, transport, castration, dehorning, nutritional change, hoof trimming, etc.) at the same time as vaccination as this may interfere with the immune response to the vaccine.

Ensure only legally permitted vaccines are used and the vaccines chosen for use do not produce antibodies in the vaccinated animal which at a future date would infer that the animal was exposed to a disease, leading to the loss of a sale. Owners should be familiar with the requirements for animals entering AI Centres and also certain export markets.



Vaccines are only as effective as the animal's immune response; injecting cattle with a vaccine does not guarantee the herd's immunity, even in animals with a strong immune system.

Vaccine limitations

Remember that even the most efficient vaccines are not 100% effective in preventing disease, and that the degree of protection afforded each animal from vaccination is variable. In some instances, vaccination does not prevent infection but only decreases the severity of clinical disease if an animal becomes infected and/or decreases shedding of infectious organisms e.g. respiratory vaccines.

Nutritional, transport, social and weather stresses can temporarily decrease the level of immune response.

There are some diseases which are caused by multiple infectious agents e.g. diarrhoea, respiratory disease, mastitis and lameness for which there are no vaccines available, or for which vaccines to protect against all of the known causes are not available. For other diseases such as Johne's disease and TB there are no vaccines licensed in the Republic of Ireland.

Although uncommon, vaccination carries the risk of adverse reactions ranging from mild injection site reactions to severe anaphylactic (shock) reactions. The risks from vaccination must therefore be carefully weighed against the benefits. Happily, regulatory authorities and vaccine companies ensure that rigorous standards are applied to ensure vaccines are of consistent quality, safety and efficacy.

VACCINATION RECORDING

Recording details of vaccine use will be of value when reassessing your herd health programme annually with your veterinary practitioner and will provide valuable information should a 'vaccine breakdown' occur.

VACCINE 'BREAKDOWNS'

In any group of animals, a small number of individuals may fail to respond to vaccination as a result of reduced immune responses. A good immune response relies on the reaction of a vaccine (antigen) with an animal's immune system to produce antibodies.

There are several reasons why a vaccine may not provide the expected results. A satisfactory immune response will only be achieved when animals are healthy. It is important to avoid vaccination of animals which have an existing disease, are unwell, or which have a poor nutritional status.

The immune response of the animal may also be compromised by other genetic factors, concurrent drug therapy and stress.

Vaccine effectiveness may also be reduced by poor storage or inappropriate administration.

VACCINATION CALENDAR

Herd owners should contact their veterinary practitioner to discuss which vaccines they should be incorporating into the animal health plan for their herd. Developing a vaccination calendar, like the example set out below, will help farmers plan their vaccination programme.

Each herd is unique and may be exposed to different disease risks so it is important to develop a personal herd risk profile and use vaccines selectively.

	February/March	March/April	August/September	October	December/January
CALVES	Prior to turnout Clostridia vaccine (Blackleg and other clostridial diseases)			Housing Pneumonia vaccines: Vaccines may cover BRSV, PI-3V, BVDV and Mannheimia haemolytica IBR*	
HEIFERS	Prior to turnout Clostridia vaccine Lungworm	Prior to breeding Leptospirosis BVD*** IBR*	Mid pregnancy Salmonella**	Housing IBR* BVD*** Pneumonia vaccines: Vaccines may cover BRSV, PI-3, BVDV and Mannheimia haemolytica	Prior to calving Scour vaccine Salmonella**
COWS	Prior to turnout	Prior to breeding Leptospirosis BVD*** IBR*	Mid pregnancy Salmonella**	Housing IBR* BVD***	Prior to calving Scour vaccine Salmonella**

*There are various protocols for IBR vaccination. Discuss with your veterinary practitioner. Do NOT vaccinate potential A.I. sires for IBR.

**All cattle vaccinated with the primary vaccination course of a Salmonella vaccine should receive a booster at least two weeks prior to each period of risk or at intervals of not more than 12 months thereafter. As part of an overall herd management programme, for pregnant cattle, it is advised that for each subsequent pregnancy, a booster should be given approximately 3-4 weeks before calving to provide a sufficient level of colostral protection for calves. The other risk for cows is abortion in late pregnancy and a booster in mid pregnancy may be considered. Discuss with your veterinary practitioner.

***Depending on the product, BVD boosters may be required every 6 months or annually.

SUMMARY

Discuss the farm's biosecurity plan with your veterinary practitioner to determine the best vaccination programme to target diseases that the cattle in the herd may be exposed to.

Vaccines are available for common cattle diseases in Ireland.

- Ireland has a rigorous process for the registration of vaccines for use by farmers
- This ensures the products are safe with minimal risk of adverse reactions.
- The list of licensed vaccines changes regularly. For details about vaccines which are available in Ireland please visit the HPRA website. (www.hpra.ie)

Note: Some vaccines, may still be licensed in Ireland, but are no longer commercially available e.g. Lactovac, Pastobov. Equally, other vaccines may be available on emergency licence (AR16 licences).

See <https://www.agriculture.gov.ie/animalhealthwelfare/veterinarymedicinesresidues/veterinarymedicinesforms/>). There are also licensed vaccines that are subject to official controls e.g. Bluetongue vaccines. Please contact your local approved supplier who may be able to advise you on the availability of products.

TECHNICAL WORKING GROUP

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