

Poultry health and disease control in developing countries

Site biosecurity and supporting strategies for disease control and prevention

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BIOSECURITY PROGRAMME FOR COMMERCIAL POULTRY PRODUCTION SITES

- Keep poultry in a fully enclosed area, to which entry by other people is physically restricted by having only one point of access. This access point should be enterable only through a foot-bath containing disinfectant.

In general, casual visitors to a poultry production site should be discouraged. Records should be kept of all visits.

THE MOST COMMON BREAKS IN BIOSECURITY OCCUR WHEN INFECTIOUS POULTRY DISEASES ARE INTRODUCED BY THE MOVEMENTS OF PEOPLE.

- Prevent contact with wild birds and vermin by physically excluding them from the site, for example, with bird netting.
- The poultry keeping area and equipment within it must be kept clean, and be disinfected every few months. Cleaning followed by disinfection is essential between batches of poultry. Concrete rather than earth flooring in poultry production areas greatly increases the effectiveness of cleaning and disinfection.
- Equipment should NOT be shared among poultry sites. If it is absolutely necessary to share items, the equipment must be thoroughly cleaned AND disinfected before and after entering any poultry production site.
- Contamination of food and water by faeces should be strictly avoided.
- Feed should be stored in secure, lidded containers; the water supply should be decontaminated, for example, by a standard chlorination treatment.

Birds and health:

- Birds should be sourced from a breeder whose bird health status is known to be good, and should be of healthy appearance on arrival at the site. The new birds being introduced should be kept separate and be the last fed every day for an initial quarantine and observation period of one month.
- Potential signs of diseases, which should be known by the farmer, can include:
 - dullness, reluctance to drink or eat;
 - diarrhoea, respiratory distress, a sudden drop in egg production;
 - inability to walk or stand, abnormal position of head, neck or wings;
 - sudden illness and/or death of several of the birds in a group.

BIOSECURITY PROGRAMMES ARE BASED PRIMARILY ON QUARANTINE OF A SITE COMBINED WITH MEASURES FOR STRINGENT HYGIENE AND DISINFECTION.

The strength of this approach is that it can be applied generally to exclude from a site ALL important diseases (see Table 2 in "Poultry Health and Disease Control in Developing Countries") apart from those that are egg-transmitted.

More specialized disease prevention and control measures to support biosecurity on a site include:

Vaccination and medication: Diseases for which these may be applied include almost all the ones listed. However in every case, the vaccine being used will be effective for the prevention of ONLY that specific disease.

Eradication can be applied for egg-transmitted pathogens ONLY. The pathogens for which commercial eradication programmes have been successfully applied are avian mycoplasmosis, avian leukosis and reticuloendotheliosis viruses; fowl typhoid; and *Salmonella pullorum*.

Immunogenetic resistance to disease is promising for Marek's disease, but is not yet commercially available.

BIOSECURITY FOR VILLAGE PRODUCTION – SMALL-SCALE SEMI-SCAVENGING POULTRY FLOCKS (NON-COMMERCIAL)

Although it is not possible to apply full site biosecurity where numerous small poultry flocks are moving about in or around common areas in a village during daylight hours, modified elements of biosecurity can be applied.

As a minimum, housing should be provided to shelter and protect birds from predators at night time.

Improved poultry health can also be achieved by combining two other general approaches:

- *The development of central higher-quality hatchery-based services for the supply of day-old chicks*

Irrespective of whether the poultry stocks being supplied to farmers in a country are of an indigenous or a commercial genotype, the laboratory screening of breeding stocks for freedom from infection, followed by the application of enhanced hatchery hygiene programmes should enable freedom to be assured from at least pullorum disease and fowl typhoid. Chicks supplied can also be protected early in their life against catastrophic diseases such as Newcastle disease and infectious bursal disease virus before leaving the hatchery (Bagust, 1998), by

having high levels of maternal antibody, which can be assured by undertaking vaccination of the parents.

- *Strengthening extension services for training farmers in health and production*

Poultry health and production extension services can quite quickly be systematically upgraded by applying information from other developing countries, such as Bangladesh, on strategies/ programmes that have proven successful in practice.

SUPPORTING STRATEGIES FOR CONTROL AND PREVENTION OF POULTRY DISEASES

The illustration of a classical building below shows that the columns (the pillars) are needed to support the roof, while the roof both holds the pillars together and protects the integrity of the building. The whole building represents the production site, and the pillars are the individual supporting activities that are integrated into an overall biosecurity programme.

The pillars represent the major technology-based approaches currently available for the control and prevention of infectious diseases of poultry. From left to right, the order of the pillars represents how widespread their use should be, starting with approaches that are suitable for widespread application, and moving towards those that are suitable only for specific uses. Thus, while quarantine, hygiene and disinfection are universally applicable against poultry pathogens, vaccination can be widely, but not always, used and eradication is currently feasible only for a few pathogens.

Pillar 1 – QUARANTINE: Currently, genetically based disease resistance is rarely of practical use in the field. This means that isolation is the only option. This is the oldest of the approaches, and dates back to Roman times (*quaranta* is Latin for 40), when a 40-day isolation period was enforced before a plague ship crew could enter a harbour or town.

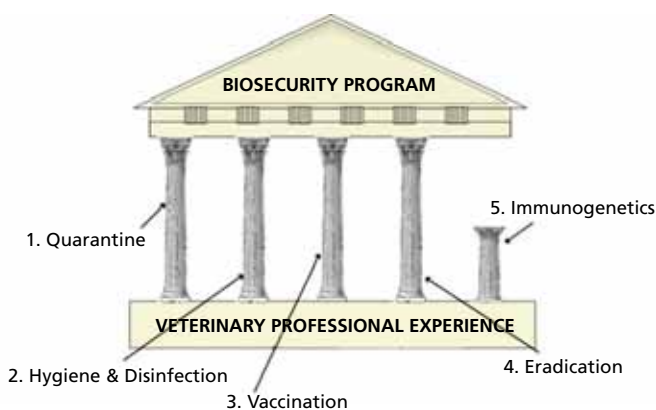
Pillar 2 – HYGIENE AND DISINFECTION – complements quarantine. When flocks are being isolated from the entry of microbes, hygiene and cleaning are the first measures used. These **must result in the removal of organic material from the surfaces to be decontaminated**, for example, in poultry houses or the hatchery, if antimicrobial disinfection treatment is to be effective.

Pillar 3 – VACCINATION is probably the easiest and most economical group of methodologies used for the control and preven-

tion of poultry diseases in poultry production. However, it should NOT be used as the sole measure on a flock.

Pillar 4 – ERADICATION is a feasible disease control option for only some specific poultry pathogens. The criteria to be met are usually that the major mode of transmission is via the egg and that relatively accurate and inexpensive lab tests have already been developed for detection of infection. Although a successful eradication programme requires major investments of resources, significant benefits can flow back to industry over the longer term.

Pillar 5 – IMMUNOGENETIC RESISTANCE to disease is not yet complete, but – as the case of Marek's disease virus demonstrates – it may soon become so. The solution may lie in the hands of commercial primary breeding companies, because genetic selection could be applied to disease resistance, should a commercial need create pressure for this. At present, however, this is not seen as a high priority relative to other growth and production parameters. In addition, there is a lack of effective tools for selecting for specific resistance to many major infectious poultry diseases.



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