Biosecurity – what is in a name?

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Biosecurity is one of today's 'buzz' words, another would be 'HACCP'. Both are over used, seldom fully understood and rarely observed to the extent they need to be as can be seen by the re-occurring outbreaks of Newcastle disease and avian influenza.

We are tempted to think that this is a modern concept. It is not – biosecurity principles were established long ago. Hygiene rules are described in the Old Testament in the Bible. History records the first written municipal ordinances that describe a 30 day quarantine for visiting sailors in the harbour city of Dubrovnik, Croatia, in 1348.

Extreme biosecurity measures

A more dramatic example of a breach in biosecurity occurred during the first recorded biological warfare event.

The Mongols lead by a grandson of Genghis Khan besieged the harbour city of Caffa in the 1340s and responded to high mortalities due to an outbreak of bubonic plague amongst their own soldiers, by throwing their dead (infected) bodies over the city walls using so-called 'siege machines'.

This caused a similar outbreak in the confined city, and resulted in the rapid evacuation by sea of all surviving inhabitants.

One of the most graphic recent examples of extreme biosecurity measures was the 'stamping out' (kill and burn) approach to the devastating foot and mouth disease epidemic in the UK a few years ago.

Similar actions have been taken by some governments in the Far East in an attempt to control the spread of avian influenza.

Each farm/animal production facility is an ecosystem, and the challenge is often to keep all the different components of this system in an economical harmony with each other.

Seen in this light it can be appreciated that biosecurity should be a constant factor in all aspects of policy and planning issues.

Biosecurity should start at the beginning and play a key role in the decision to purchase a particular farm. Its merits should be evaluated against biosecurity issues such as present and allowable use of adjacent land. Clearly the purchase of a poultry farm should be reviewed, in the light of the use of adjacent land, particularly if it a wildfowl sanctuary!

Site layout and building design

Biosecurity should be built into the site layout and design of the buildings, the materials used and in equipment selection.

Positioning of buildings so that prevailing wind direction is taken into account, access road layout should be such that the contamination of occupied houses from litter being taken off site is avoided. Building design that facilitates good movement control, material that incorporates easy to clean surfaces, equipment that incorporates automated chemical dispensing are all plus points.

People

Biosecurity issues should influence personnel selection, training and awareness programmes.

These programmes should include easy to manage systems such as different coloured overalls for personnel working in different areas and strict enforce- ment of movement rules, which must also be applied to management, VIPs or other visitors.

SOPs

Biosecurity should be built into Standard Operating Procedures (SOPs). There is more to HACCP than putting up yellow and black signs at entrances.

Using a HACCP type of approach for analysing the process is most useful for anticipating problem areas or early recognition of patterns that start to deviate from the normal or expected parameters, such as day old chick quality parameters, first week performance data, serological and bacterial monitoring and the like. A HACCP paradigm will determine what actions should be written into the SOPs.

Measurements

Biosecurity effectiveness can and should be measured. Audit your operational plan and test it to see that it is doing what you designed it to do.

Disinfectants

Biosecurity and disinfectants are commonly associated with one another. The foot and mouth disease disaster in the UK is not an all embracing credible or damming reference for any chemical because disinfectants alone will not ensure success.

Because biosecurity is a day to day issue relevant to any size and type of animal production system it should not be considered only in times of a national crisis. An integral element of on-going preparedness would be the drawing-up of selection criteria to evaluate available alternative disinfectant products.

Such criteria should include at least these key issues:

- Spectrum of activity; does it kill the indicator organisms relevant to your needs?
- Kill rates should be at least 99.99%.
- Stability of the concentrate and diluted solutions (activity measured in hours or days could be a practical liability if inactivated mixed solutions continue to be used past their effective life).
- Are the contact times practical in your particular situation? There is no point in using a chemical which takes one hour to kill micro-organisms if in your climate surfaces will be dry in, say, 10 minutes.
- Is it safe to apply in terms of toxicity and eye and skin irritation or does it require protective clothing or respirators? People being people will take short cuts if they are required to use harmful chemicals!
- Can it be used in the presence of animals (biosecurity is not something that can be left to terminal clean-outs only).

In addition, remember if restricted to terminal clean out you only get one shot to kill, whereas if the product can be used alongside the birds micro-organism levels can be reduced on a daily basis.

- Is it non-corrosive in practical terms? This will reduce the impact on maintenance and, hence, equipment replacement costs.
- Is it biodegradable so that run-off hazards into water courses and the environment in general are eliminated?
- Is the disinfectant relevant to your situation? There is little point in taking into account low temperature capabilities if your year round ambient temperatures are 20°C and above.
- Accreditation, whatever form it is in, is important, but testing generally that has been carried out by independent laboratories which are certified as competent to do the tests, in your situation is more important for day to day use chemicals in ensuring that the results are reliable.
- Economy is always important but be sure to get the numbers right; calculate the cost of the working solution because dilution rates can vary. But do not get carried away on this last point because in terms of total costs disinfection costs are very small.

Total biosecurity strategy

So, in essence what we are saying is that biosecurity is not just disinfection and that if you view it as such your programme will often fail because key non-disinfectant factors will let you down.

To get the most out of your disinfection programme you must look at its positioning in your total biosecurity strategy. Finally, remember your total biosecurity programme is like a chain – it is only as good as its weakest link! ■

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