Monitoring Your Biosecurity Program

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The poultry industry whether involving broilers, layers or turkeys requires a high degree of biosecurity to ensure the safety of all production operations. Biosecurity should be defined as any and all management practices that specifically prevent or reduce the introduction of disease causing organisms into the poultry operation. The program should also be tailored to the specific operation (live production, hatchery or processing area). The importance of a biosecurity program is essential for reduction of poultry and human pathogens. Examples of poultry pathogens would include highly pathogenic avian influenza, velogenic Newcastle disease virus, and the variant viruses such as laryngotraheitis and mycoplasmosis. Examples of human pathogens would include salmonella enteritidis and typhimurium. With regard to Hy-Vac's operations, all diseases (Table 1.) must also be eliminated. The biosecurity program also allows the poultry operator to promote the animal's full genetic potential and provide an optimum return on the investment to generate profits. In contrast to results that may demonstrate slower growth, poor meat yields, decreased egg production, excess condemnations or reduced product quality and poor customer satisfaction.

Components of a biosecurity program:

1. **Vectors - all elements that can transmit disease to an operation (people, feed, environment, insects, wild birds and animals).**
2. **Cleaning procedures – what equipment and specific ways to clean an operation?**
3. **Disinfectant procedures – what types to utilize and how to apply?**
4. **Fumigation procedures – is the procedure an option?**
5. **Monitoring – establishing that the program works.**
6. **Safety – are the procedures protecting the operation and the personnel involved?**
7. **Cost – are the procedures an expense that protects the final return of the investment?**

A management procedure to eliminate pathogen introduction via vectors requires the cooperation of the entire operation. The first step is to examine the operation as a closed system in order to control those elements that cause the system to become open and allow disease to enter. As each operation is different, the procedures implemented may also be different from farm to farm, complex to complex and company to company. Hy-Vac also utilizes a Rule and Procedure Form which each employ reads and signs (Table 2).

Vector Control - People

1. Establish traffic controls to individual farms and between farms. This would be utilized for farm personnel (house caretakers) and non-farm personnel (veterinarians, flock service, etc.), company vehicles (manure removal, feed, etc.) and non-company vehicles (propane, electrical utilities, contractors repairs, etc.). All vehicles should be disinfected prior to entry and all non-farm personnel should first check with the farm manager.
2. Entry into houses by all personnel should require disinfectant foot baths and non-farm personnel should be required to wear external disposable coveralls or boots. Breeder operations should require shower-in and shower-out facilities.
3. Disinfectants utilized should follow a rotation usage schedule (Table 3.)

Vector Control – Animals

1. Animal control should consist of a rodent and "other" program.
2. Rodents should be controlled via established bait stations around and in buildings (poultry houses, pit area, walkways, storage sheds, etc.).
3. Bait stations should be monitored weekly and stocked with the appropriate rodenticide via a rotation schedule (Table 3.).
4. "Other" animals such as stray dogs, cats, raccoons, skunks etc., should be kept from the premises via mortality management or reject egg management.
5. "Other" bird management should be the removal of all nests on building structures.

Vector Control – Insects

1. Insect control will vary based on geographical locations. However, programs should recognize the common varieties such as flies, darkling beetles, etc. (Table 4).
2. Insect control should also be examined during seasonal episodes for maximum protection.
3. Insect control should utilize effective house management techniques (litter or manure management) and pesticide treatments according to manufacture label directions.

Vector Control – Feed

1. All feed vehicles should be disinfected before entry to the farm.
2. Any feed spillage should be cleaned immediately.
3. Feed should be heat-treated (pelleted – crumbled).
4. Feed should include a bacterial treatment (formalin, acetic acid).

Vector Control – Environment

1. Excess dust, feathers and other environmental debris should be cleaned from air inlets and exhausts on a routine basis as well as any other areas where accumulation has occurred.
2. Water sources should be examined and treated with chlorine when appropriate.

What and How to Clean

The proper cleaning of poultry houses and equipment is the second step of the overall biosecurity program. The process protects current flocks on the farm but more importantly provides the best environment for the arrival of the next flock. The exact sequence of events may differ from operation to operation, but essentially consist of the following parts:

1. Bird depopulation – live haul or rendering operation.
2. Collection and disposal of final mortality and culls.
3. Manure removal or litter management (removal of cakes, raking and turning).
4. Dust removal from sidewalls, curtains and equipment.
5. Equipment removal.
6. Building and equipment wash down (high-pressure spray @1300-1500 psi and 160-180 degrees F., soap, and bleach).
7. Repairs as required.
8. Set-up major equipment.

9. Disinfectant application (high-pressure spray @ 500-800 psi and 30-40 degrees F.).
10. Final equipment set-up and building preparation (supplies etc.).
11. Fumigation.

Disinfectants

1. The selection of the disinfectant should be based on the overall elimination potential. Various disinfectants work on a variety of organisms (bacteria, viruses, fungi, etc.).
2. Disinfectants have different exposure times as well as compatibility with surface structures.
3. Clean and non-porous surfaces clean the easiest. Chlorine and peroxides are not recommended for metal surfaces, while phenols are recommended for brick surfaces.
4. Temperature and humidity during use may also affect disinfectants. Chlorine and iodine can loose concentration at high temperatures while low humidity may increase exposure time.
5. Apply at manufacture recommendations and according to EPA and OASHA regulations.
6. Cost of disinfectants should be evaluated on working solution price not concentrate price.

Fumigation

1. Fumigation procedures and applications is the best final method of disease prevention.
2. Not option in some areas of country (EPA approval).
3. Requires strict training and supervision.
4. Seal building and apply with respirator.
5. Utilize formalin solution and potassium permanganate crystals.
6. Utilize 24-hour reaction time.
7. Air building for 24 hours post exposure.

Monitoring Program

1. Observations of farm traffic and examination of log records.
2. Daily inspections of foot baths.
3. Weekly inspections of bait stations.
4. Weekly production meetings with farm personnel.
5. Weekly sampling of building environment (Salmonella, Table 5).
6. Weekly blood sampling of flocks (Table 1).
7. Weekly testing of eggs (useability).

The most effective program is one that is coordinated among house caretakers, farm managers and the operational manager. Although general outlines can be followed, specific procedures must be developed by individual operations. The key to success is to have a plan, follow the plan, change the plan when necessary and enforce the procedures.

References:

1. General Guidelines for Biosecurity and Cleaning & Disinfection, M. David, SE Task Force, 3/1990.pp1-18.
2. Disinfecting poultry houses requires attention to details., H.M. Opitz, Poultry Digest, 8/1996. Pp. 26-31.
3. Hy-Vac Standard Operating Procedures, A. Yersin. 1997. (Internal Publications).

TABLE1.

QUALITY CONTROL REPORT **DATE:**

AGENT	TEST *	TEST DATE	RESULT
Avian influenza - Type A Negative	AGP	09-11-97	
Avian reovirus	AGP	09-11-97	Negative
Avian adenovirus: Group I (Celo, Types 3 & 7)	AGP	09-11-97	Negative
Avian adenovirus: Group II (HEV	AGP	09-11-97	Negative
Avian adenovirus: Group III (EDS-76)	HI	09-11-97	Negative
Avian encephalomyelitis virus	ELISA	09-10-97	Negative
Fowl pox (Clinical)	AGP	09-11-97	Negative
Haemophilus paragallinarum	AGP	09-11-97	Negative
Infectious bronchitis: Mass and Conn	ELISA	09-10-97	Negative
Infectious bronchitis: Arkansas and JMK	VN	06-24-97	Negative
Infectious bursal disease	ELISA	09-10-97	Negative
Infectious laryngotracheitis	ELISA	09-10-97	Negative
Lymphoid leukosis antibodies, Groups A,B	ELISA	09-11-97	Negative
Lymphoid leukosis virus, Groups A,B,C,D	ELISA	09-12-97	Negative
Mareks disease virus, serotypes 1,2,3	AGP	09-11-97	Negative
Newcastle disease virus	HI	09-11-97	Negative
Paramyxovirus - Type 2	HI	09-11-97	Negative
Reticuloendotheliosis virus	AGP/ELISA	09-11-97	Negative
Mycoplasma gallisepticum	SPA	09-09-97	Negative
Mycoplasma synoviae	SPA	09-09-97	Negative
Salmonella gallinarum	SPA	09-09-97	Negative
Salmonella pullorum	SPA	09-09-97	Negative
OTHER TEST			
Salmonella Other Types including S.enteritidis (Monthly-Test)	CULTURE	09-11-97	Negative
Avian Nephritis (Quarterly Testing)	FA	06-23-97	Negative
Turkey Rhinotracheitis (Quarterly-Testing)	ELISA	06-23-97	Negative

***AGP**-AGAR GEL IMMUNODIFFUSION
ELISA-ENZYME LINKED IMMUNOSORBENT ASSAY
HI-HEMAGGLUTINATION INHIBITRON
SPA-SERUM PLATE AGGLUTINATION
VN-VIRUS NEUTRALIZATION
FA-FLUORESCENT ANTIBODY

FLOCK: HATCH DATE: 100% TEST DATE:

WEEKLY BLEEDING DATE: BLED THIS TEST NUMBER TIMES TESTED:

TESTING SUPERVISED BY _____

TABLE 2.
BIOSECURITY RULES & PROCEDURES FOR EMPLOYEES

The following employee Biosecurity Rules and Procedures are designed to prevent the contamination or spread of disease to Hy-Vac production and breeding stock. These Rules are supplemental to the Employee's Rules of Conduct contained in the Employee handbook.

Each Hy-Vac employee shall strictly adhere to the following Biosecurity Rules. Failure to do so may result in immediate termination of employment, to be determined by the employee's supervisor, the General Manager and/ or the Company President.

I. Biosecurity

A. No birds, game, or poultry at home. No wild bird hunting.
B. Disinfect vehicle tires upon entry at farm and maintain vehicle in clean bio-secure condition.
C. No unauthorized personnel (relatives, friends, etc.) on farm or in production house without permission from supervisor, general manager and/ or company president. Any such individual must also agree to adhere and follow all elements of these Biosecurity Rules.
D. Use foot pan disinfectant when ever present.
E. Maintain disinfectant solutions for foot pans and misters and notify farm manager and/or assistant when supply is needed.
F. Shower into and out of all production units.
    1. Leave street clothes in change area before entry shower.
    2. Shower into the house using sanitizing soap and shampoo-wash hair etc, each time. Shampoo/Conditioner can be supplied by caretaker but must remain in the shower area. No other cosmetics should be in the house.
    3. Re-dress in the SPF clean side of the shower into Hy-Vac supplied clothing.
    4. No food items are allowed into the house unless they are manufacture sealed and can be washed into the house and/or disinfected, i.e., full snack bags, cans or sealed containers of food/soup, full loaves of bread or full sealed containers of crackers.
G. Maintain Ventilation system at a minimum static pressure of .25 to .30 reading on the Manometer. Notify farm manager and/or assistant if not functioning properly.
H. Make sure that <u>all</u> items coming into the Production unit are sanitized through the cooler by the Assistant and/or Farm Manager. This includes but not limited to personal microwave, coffeemaker or hot plate.
I. No TV's, radios or audio equipment is to be present in the production houses unless supplied by Hy-Vac and properly sanitized into the house buy the Assistant and/or Farm Manager.
J. No cleaning materials, curtains, blinds or rugs unless supplied by Hy-Vac & sanitized by the Assistant and/or Farm Manager are permitted into the production unit.

I have been given a copy of the foregoing Biosecurity Rules, understand them and agree to follow them. My failure to follow these rules may result in termination of my employment with Hy-Vac. I further understand that these rules may be changed or modified as directed by company management.

Employee Signature:

Employee Name (print): Date:

TABLE 3.

RODENTICIDE ROTATION			
TIME TABLE	**PRODUCT**	**ACTIVE INGREDIENT**	**MANUFACTURER**
OCT / NOV	TROUNCE	BROMETHALIN	PURINA
DEC / JAN	JUST ONE BITE	BROMADIALONE	FARNAM
FEB / MARCH	JAGUAR	BRODIFACOUM	MOTOMCO
APRIL / MAY	RAMPAGE	BROMETHALIN	MOTOMCO
JUNE / JULY	TOMCAT	DIPHACINONE	MOTOMCO
AUG / SEPT	HAVOC	BRODIFACOUM	SCHERING

FUMIGATION ROOM SANITIZE SOLUTION		
TIMETABLE	**PRODUCT**	**CONCENTRATION**
OCT / NOV	SUPER HDQ	1 OZ / GALLON
DEC / JAN	VIREX	1 OZ / GALLON
FEB / MARCH	BLEACH	2 OZ / GALLON
APRIL	SPARQUAT 256	1 OZ / GALLON
MAY	BLEACH	2 OZ / GALLON
JUNE	SUPER HDQ	1 OZ / GALLON
JULY	BLEACH	2 OZ / GALLON
AUGUST	VIREX	1 OZ / GALLON
SEPTEMBER	BLEACH	2 OZ / GALLON

NOTE: *In order to break the use of quaternary ammonium compounds we will be alternating with a chlorine disinfectant. It is essential to completely empty the foggers before stocking with the new disinfectant. During the heat of the summer we will change the product monthly to minimize any residual build up.*

** All houses should be stocked with the above products, so the house managers can assist with keeping the foggers stocked and rotated.*

****** Foot pans should follow the same rotation***

TABLE 4. INSECTICIDES

PRODUCT	FORM	USED FOR
COUNTDOWN	POWDER/LIQUID	FLIES, BEETLES, GNATS,SPIDERS
DAIRY BOMB	AEROSOL	FLIES, GNATS,SPIDERS
DAIRY SPRAY	AEROSOL	FLIES, GNATS
DRY-FOG DROPUM	AEROSOL	FLIES, GNATS,SPIDERS
ECTIBAN	POWDER/LIQUID	FLIES, GNATS, SPIDERS, BEETLES
GOLDEN MALRIN	GRANULES	FLIES
GRENADE	LIQUID	FLIES, GNATS, SPIDERS, BEETLES
LARVADEX	LIQUID	FLIES
Q-MIST COUNTRY VET	AEROSOL	FLIES, GNATS
ULD BP 300	LIQUID	FLIES, GNATS, SPIDERS, BEETLES

PRODUCT	HOW APPLIED
COUNTDOWN	PUMP UP SPRAYER TO WALKWAYS AND UPPER CRUST OF MANURE
DAIRY BOMB	AEROSOL CAN IN SMALL TO MEDIUM SIZED ROOMS
DAIRY SPRAY	AEROSOL CAN IN SMALL TO MEDIUM SIZED ROOMS
DRY-FOG DROPUM	AEROSOL CAN IN SMALL TO MEDIUM SIZED ROOMS
ECTIBAN	PUMP UP SPRAYER TO WALKWAYS AND UPPER CRUST OF MANURE
GOLDEN MALRIN	RANDOMLY PLACED ON FLOORS OUT OF TRAFFIC AREAS
GRENADE	PUMP UP SPRAYER TO WALKWAYS AND UPPER CRUST OF MANURE
LARVADEX	PUMP UP SPRAYER TO WALKWAYS AND UPPER CRUST OF MANURE
Q-MIST COUNTRY VET	AEROSOL CAN IN SMALL ROOMS MAINLY IN METERED CABINETS
ULD BP 300	HI-VOLUME FOGGER, MISTER

PRODUCT	WHEN USED
COUNTDOWN	PRIOR TO HOUSING AND MODERATE TO HEAVY INFESTATION AFTER
DAIRY BOMB	SPOT SPRAYING SMALL AREAS OF LIGHT INFESTATION
DAIRY SPRAY	SPOT SPRAYING SMALL AREAS OF LIGHT INFESTATION
DRY-FOG DROPUM	SPOT SPRAYING SMALL AREAS OF LIGHT INFESTATION
ECTIBAN	PRIOR TO HOUSING AND MODERATE TO HEAVY INFESTATION AFTER
GOLDEN MALRIN	AT ORIGINAL ONSET OF LIGHT FLY INFESTATION
GRENADE	PRIOR TO HOUSING AND MODERATE TO HEAVY INFESTATION AFTER
LARVADEX	PRIOR TO HOUSING AND MODERATE TO HEAVY INFESTATION AFTER
Q-MIST COUNTRY VET	MAINTENANCE SPRAYING IN SMALL ROOMS VIA TIMED CABINET
ULD BP 300	PRIOR TO HOUSING AND MODERATE TO HEAVY INFESTATION AFTER

{HY-VAC ALSO EMPLOYS THE USE OF LIGHT TRAPS FOR THE ERADICATION OF FLYING INSECTS IN AREAS THAT SPRAYING IS NOT FEASIBLE, SUCH AS OFFICES AND HALLWAYS}

TABLE 5.

SALMONELLA MONITORING PROCEDURE

Environmental Swab Procedure:

To assure **no** contamination prior to sampling;

1. Wash hands thoroughly with water and anti-bacterial soap.
2. Do **not** do other duties i.e. pick-up dead or clean while doing the Salmonella testing.

Floor Drag Swabs

1. UN-wrap string from sponge
2. Pour 20 ml. (1/2 of the vile) of milk into the sample bag and soak into the sponge. You will take two (2) floor swabs per flock i.e., hatch group.
3. Drag across the floor (one per hand i.e., two floor drag swabs) and make sure that you cover the full length of the floor. Go down one side, across the end, back the other side, across the end, thus completing a full circle around the house.
4. Cut string from the sponge and place the sponge back into the bag.

Dust Swabs Utilize the swabs with no string, wearing the enclosed sterile glove while swabbing the vents. (These swabs were used to swab nests before.)

Pour 20 ml. (1/2 of the vile) of milk into the sample bag and soak into the sponge before swabbing.

Swab 1 Wipe dust from the two corner vent louvers on side one of the house.

Swab 2 Wipe dust from the two corner vent louvers on the opposite side of the house.

- Each swab should be coated with dust.
- Use both sides of the sponge, one side per louvered vent.
- Add the remaining 20 ml. (1/2 vile) after taking the swab. This will be 40 ml. or (1 vile) of milk per vent swab.

Sample Identification

Mark each sample as follows:

- House number
- Hatch date of Flock Sampled
- Date Swabs taken

NOTE: NO litter samples are required.
NO swabs of nests are required.
MAKES SURE ALL BAGS ARE SECURELY CLOSED (plastic bag folded two times and then the wire ties folded over to secure).