AN EARLY START ON PROTECTION FOR A MORE PROFITABLE BUSINESS

CONVENIENCE PROGRAM

Provided by MSD Animal Health

MSD Animal Health

THE CONVENIENCE PROGRAM AND AUDIT DRIVE PROTECTION AND PROCESS IMPROVEMENT

The Convenience Program from MSD Animal Health is the first "full spectrum" respiratory health and immunity programme that also focuses on process and performance improvement.

The program is called "Convenience" because not only is administering vaccinations in the hatchery more convenient, it's more efficient, more accurate and less reactive.

The driving force behind the Convenience Program is the growing global demand for protein. Poultry market dynamics require shorter flock cycles enabling more production from existing resources. That means advances in poultry health must keep pace with advances in nutrition, genetics and flock husbandry.

Shorter flock cycles leave no room for disease or vaccine reaction-related lapses in programmed rates of gain. When respiratory disease prevention moves into the hatchery, not only are chicks protected earlier, they also avoid periods of vaccination-related inappetence during periods of expected heavy weight gain.

The Convenience Program offers four features intended to develop flock-specific respiratory protection plans that maximise flock health and production efficiency. The four features are:

- **Respiratory Risk Analysis**
- **The Protection Plan**
- **The Support Program**
- **Results Determination**

These features, customised to each customer's needs, add up to improved processes and, ultimately, to improved performance.

The Convenience Audit

The cornerstone of the Convenience Program is the Convenience Audit. The Convenience Audit is designed to help producers standardise new and improved poultry health and management processes so they can be repeated accurately and effectively. The audit consists of two basic areas of focus: vaccines (preparation and administration) and the Chick Quality assessment program. This publication intends to provide further information about these topics.

Vaccines/Vaccine Administration

This section includes defined processes for proper vaccine storage, handling and preparation. It also seeks to standardise equipment sanitation, calibration and operation among three methods of vaccine delivery — spray cabinets, in-ovo and subcutaneous. Proper compliance with the written standards will optimise speed, safety, vaccine uptake and minimise waste.

The Chick Quality Assessment

This is a process to be employed when chick mortality exceeds a predetermined rate. It is a resource MSD field teams can deploy to help producers understand the causes of excessive mortality and focuses the team on specific areas of inquiry so they may be eliminated.

Ultimately, the impact of the Convenience Program and Audit will be seen in healthier birds, fewer problems in the field and better overall flock performance. Downstream, carcass quality will become more consistent leading to improved processing efficiency. Improvements in knowledge and processes will, in turn, drive increases in financial performance and promote a safer, more abundant and sustainable food supply. ■

THE CONVENIENCE AUDIT DEFINES STANDARDS FOR VACCINE PREPARATION, DELIVERY

Breeding, nutrition, flock husbandry and poultry health combine to determine overall flock performance and a producer's success in achieving financial goals. Poultry health begins with disease prevention and a vaccination regimen is at the heart of every poultry health plan.

A wide variety of vaccines addresses nearly the complete range of poultry diseases. Each vaccine has its own characteristics that help it program the bird's immune system to develop disease-preventing antibodies in the face of a disease challenge. But all vaccines share the common requirement of careful preparation and accurate administration to ensure uptake and activation in the bird.

The Convenience Audit

The Convenience Audit is MSD Animal Health's set of vaccination audits designed to make vaccine preparation and administration a safe, effective and consistently accurate undertaking. These audits feature a proprietary scoring system so deviations from norms as well as improvement subsequent to remediation can be quantified. Because of their prevalence and complexity, the Convenience Audit focuses on process standardisation for three methods of vaccine delivery: subcutaneous injection, spray application and in-ovo injection.

For each method, attention is placed on the vaccines themselves (storage, preparation and handling) and the administration of the vaccines (equipment sanitation, calibration and operation). Standardisation of these operational procedures is absolutely essential to process large numbers of birds quickly and safely while optimising vaccine uptake throughout the flock.

Certain audit steps — scrutiny of mixing room status, liquid nitrogen management (for Marek's vaccine) and vaccine preparation — are common to all three vaccination methods. They are shown below. Process and audit procedures for vaccine administration are unique to each method and are broken out in each method's section.

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Audit steps common to all methods

Mixing room status

1. Room separate from chick processing room and other rooms?
2. No traffic through vaccine mixing room?
3. Adequate lighting over vaccine mixing area?
4. Mixing room clean and orderly?
5. No storage materials placed in mixing room?
6. Does mixing room have positive air pressure?
7. Ventilation ducts clean?
8. Spray and Marek's vaccine mixing station separated by space and time?

Liquid nitrogen management

1. Liquid nitrogen level in LN tank 6 inches (15 cm) or more?
2. LN level checked 3 or more times per week?
3. Records of LN checks and refills kept?
4. Personal protective gloves and face mask worn when working with LN?

Vaccine preparation

GENERAL

1. Vaccine preparation surface cleaned with soap and water and sprayed with alcohol prior to vaccine mixing?
2. Operator's hands cleaned with soap and water prior to mixing?
3. Gloves and safety glasses worn during mixing?
4. Diluent stored at room temperature?
5. Diluent inspected for clarity and color change before mixing?
6. Separate syringe and needle used for each product injected into bag?

WATER BATH

7. Water bath cleaned daily with soap and water and sprayed with alcohol?
8. Distilled water used?
9. Chlorine added to water bath?
10. Water bath temperature monitored and maintained at 77 to 80° F (25 to 27° C)?

RECONSTITUTION

11. Diluent bag port and bottle top swabbed with alcohol prior to each use?
12. 18-gauge needle used to add thawed vaccine?
13. Maximum of 4 vaccine ampules removed from LN and thawed at a time?
14. Total time to thaw is 70 to 90 seconds?
15. Hands and vaccine vials dried with clean paper towel before removal?
16. Vaccine withdrawn from vial and added to diluent slowly (3 sec. per step)?
17. Vaccine vials rinsed with diluent?
18. Vaccine vials completely emptied?
19. Diluent bag gently agitated after addition of vaccine?
20. Preparation time recorded on each vaccine bag?
21. Cooler with clean ice used to transport mixed vaccine?

The Convenience Audit Defines Standards...
cont. from pg. 3

Spray Vaccination

One of the key process changes required to facilitate faster growing broilers is moving a wide variety of disease-preventing vaccinations backwards from the broiler house to the hatchery. Live respiratory (viral), coccidial and salmonella vaccines may all be administered by spray in the hatchery in cabinets specially designed to inoculate large numbers of birds efficiently and effectively. Hatchery spray cabinets can also deliver probiotic cultures and competitive exclusion products that seed the gut with beneficial bacteria before pathogenic bacteria can take hold.

Spray vaccination seems easy in theory, but extreme care must be taken in setting up and running the process to ensure proper vaccination. The spray pattern is particularly important as the routes of vaccine uptake include the eyes, the nares and preening vaccine droplets from the down, so coverage of the entire vaccination box is essential.

Routes of exposure during spray vaccination

In addition to the advantage of rapid, mass application, vaccination by spray induces good mucosal and systemic immunity. When properly administered, spray vaccination offers multiple routes of exposure to the vaccine, including eye drop, nasal drop and oral application. While in the chicken box, droplets fall directly on the eye and on the nares and will be inhaled. Droplets will also fall on the feathers and, during preening, will be ingested orally. Vaccine droplets that are inhaled will attach to the mucosae of the upper respiratory tract while those that are swallowed go to the enteric tract.

The spray vaccination audit

Assessment of the readiness of the spray vaccine solution

1. Vaccine temperature 2 to 8° C?
2. Distilled water used to prepare?
3. Water pH is 6.0 to 7.5?
4. Vaccine volume is correct (number of doses x volume)? Example: 21 ml for every 100 chicks
5. Vaccine is diluted properly?
6. Vials are rinsed at least twice after dilution?

Evaluation of the vaccination process

7. The volume of the spray is correct and in the correct pattern to cover the box?
8. No leaks in the system?
9. The cabinet pressure is adjusted to 40 to 50 PSI?
10. The vaccine is uniformly distributed on the chicks in the box (95%)?
11. The time of vaccination from dilution to final application is 45 min.?
12. The spray nozzle height is correct?

Spray cabinet maintenance

13. The spray cabinet plastic tubing is in good condition?
14. The barometer (pressure sensor) is working correctly?
15. Lubrication of the system is performed at least 3x per week?
16. The hatchery has repair kits and extra nozzles on hand?

Subcutaneous Vaccination

Subcutaneous injection is one of the oldest vaccine delivery methods in the global poultry industry. In some countries, where spray cabinets are less common and in-ovo vaccination machines are not available, subcutaneous injection is still the primary means of getting vaccines into birds.

Whether the injection is done by hand or with highly automated and sophisticated machines, the process of subcutaneous vaccine delivery must be well organised and controlled.

The Convenience Program incorporates defined processes and standards of performance for both the vaccine preparation and vaccine injection components to ensure bird safety and vaccine uptake.

(See audit criteria on next page.)

The subcutaneous vaccination audit

Vaccine administration

GENERAL

1. Vaccination equipment cleaned daily?
2. Reconstituted vaccine bag changed aseptically; spike touches only inside of port; does not touch hands or other non-disinfected surfaces?
3. Vaccine bag gently agitated every 15 minutes during vaccination?
4. Vaccine is used within 45 minutes of mixing?

DAY-OLD VACCINE INJECTION

5. Type of vaccination equipment used?
6. Vaccination equipment calibrated?
7. Satisfactory cleaning of vaccination equipment during vaccination?
8. Needles examined every hour and changed as needed?
9. Speed of vaccination — chicks per hour?
10. Are birds visually inspected for proper vaccine application?
11. Vaccination Accuracy Points scored

In-ovo Vaccination

This increasingly useful method of vaccination allows for the automated, accurate, mass application of vaccines while, at the same time, provides for unit dosing of individual eggs. The result of in-ovo vaccination is a quick, precise and safe delivery of a single dose of vaccine to the amnion and/or embryo of each hatching egg.

A number of factors drive the growing use of the in-ovo vaccination technique. Chief among them are:

- Earlier Immunity; simultaneous delivery, around ED18,5, of several (in-ovo) vaccines results in day-old chicks that have already developed active immunity against the most important diseases before they are placed on the farm.
- Uniform delivery; in-ovo vaccination is an automated and uniform process. A proper vaccine dose is delivered to every hatching egg. This is far better reliability compared to subcutaneous vaccine delivery to chickens after hatch (SC failures 5–30%).
- Easier logistics regarding chick delivery; time is reduced from hatchery machine to farm because post-hatch vaccinations have been eliminated.
- Reduced stress; birds are less stressed when vaccinated in-ovo versus handling and injection after hatch.
- Lower labor costs; labor costs are significantly reduced compared to day-old subcutaneous vaccination.
- More vaccines suitable for in-ovo delivery; Marek's vaccines, Recombinant HVT vaccines ND/ILT/Gumboro/AI, Antigen/antibody complex vaccines (Gumboro), Conventional vaccines (Gumboro, coccidiosis, ART, Pox), with many more under development.

Although the process is highly automated, successful results are highly dependent upon precise placement of the vaccine within the egg and upon delivering an accurately metered vaccine dose. Safety of the embryo, once its protective shell has been pierced, must be guaranteed through rigorous biosecurity practices.

These requirements concerning the vaccines, the equipment and the people charged with operating it, have been carefully thought through and incorporated in the in-ovo vaccination section of The Convenience Audit.

The in-ovo vaccination audit

Vaccine administration

GENERAL

1. Vaccination equipment cleaned daily?
2. Reconstituted vaccine bag changed aseptically; spike touches only inside of port; does not touch hands or other non-disinfected surfaces?
3. Vaccine bag gently agitated every 15 minutes during vaccination?
4. Vaccine is used within 45 minutes of mixing?

IN-OVO VACCINE APPLICATION

5. Perform QC plate calibration?
6. Needles checked and replaced (bent) when vaccine bag changed?
7. QC plate checks done after each buggy and plugged needles unplugged?
8. No visible vaccine on eggs?
9. QC Plate Test scoring?

Conclusion

Flock health is an indispensable component of flock performance and, by extension, financial success. Considering the pivotal role the vaccination regimen plays in the flock health programme, it is essential this process be subject to the kind of detailed scrutiny provided by the Convenience Audit to ensure it is consistently accurate, effective and repeatable. ■

CHICK QUALITY PROBLEMS: FIELD AND HATCHERY ASSESSMENT

Linnea J. Newman, DVM, dip. ACPV

The Chick Quality assessment is an extension of the Convenience Program audit in that it offers quality control and remediation insights if the flock experiences difficulties in the days immediately after it leaves the hatchery. Since these difficulties likely originated from conditions in the hatchery or during brooding, the Chick Quality assessment begins with determining where to focus.

The Chick Quality Assessment Process

Problems with chick quality may present as mortality exceeding one percent at seven days, poor seven day body weight, or as "uneven birds" within the first week. It is a best practice to do regular monitoring of egg pack, hatchery sanitation, egg breakout and, sometimes, day-old chicks to prevent chick quality problems in the field. Unfortunately, even extensive hatchery monitoring can't always predict chick quality problems. It is helpful to know where to look for the source of the problems encountered in the field, so that a more revealing diagnostic evaluation of potential causes of the problem can be discerned.

Post-mortem of Dead Chicks 3–4 Days of Age

When evaluating flock health in general, it is advisable to do post-mortem examinations of randomly selected, representative birds. But when the problem is mortality, the examinations must focus solely on the DEAD birds. In the case of chicks, post-mortem examinations should be conducted on a minimum of 50 dead birds from flocks at three to four days of age.

When conducting these examinations do not use scissors as it is very important to maintain an intact abdominal wall so that both the external and the internal navel can be observed to assess healing or signs of infection.

A good procedure to follow is to fold the wings across the breast bone, and grasp the top of the breast at the clavicle, while the other hand grasps the spine to steady the body. Now pull your hands apart, literally "unzipping" the chick, and leaving its abdominal skin intact.

As the number of examinations mounts, it soon becomes evident there are a number of different causes driving the high mortality rate. Make a quick assessment of each main cause of mortality and sort the carcasses into individual groups representing each problem. When the examinations are complete,usually one particular group predominates, and that is where to begin the troubleshooting process.

Common Lesions – and Where They Lead

Very young chicks are affected by a handful of very common lesions that do not require extensive laboratory back-up.

1. Dehydration / Starve-out

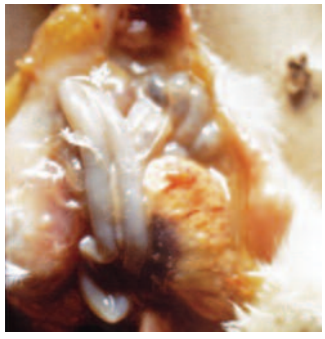
These are small, dried-up chicks that might never have attempted to eat. The muscle is darker in color and may be tacky, and the ureters often form two white strings on top of the kidneys because they are filled with urates. They do not have a foul smell. Often, they come from the youngest breeder flocks in production. It is a best practice to investigate flocks at three to four days of age, when dehydrated or starve-out chicks will still be obvious. They will be missed if the examination is delayed until the flock is seven days old.

When this is the primary problem, begin by observing the management conditions of the brooding area. Cool floors with minimal litter for insulation are a common cause so this problem is most often found during the winter season. Water accessibility (drinker height, pressure, air locks) should also be considered. If the group of dehydrated chicks is accompanied by a similar-sized group of chicks with infected navels, overheating during incubation or hatch must be considered. Adverse incubation and hatching conditions (especially overheating) will produce weak chicks that struggle with minor deficits in field management.

Assessment areas: Brooding management and incubation / hatching

2. Yolk sac infection

When dead chicks with yolk sac infection are opened, the yolk often breaks, releasing very foul-smelling fluid. Normal yolks are difficult to break; they are yellow-green and the contents are the consistency of honey. Infected yolks may exhibit a variety of appearances; in color they may be bright yellow, brown, hemorrhagic and smell very bad. These will almost always be contaminated with *Escherichia coli*, but when infections are related to a specific flock source and other causes are ruled out, consider culturing for *Salmonella spp*.



If yolk sac infection is the primary problem, begin by observing the egg pack and egg handling from the breeder farm through setting at the hatchery. Thin shells, dirty shells and wet shells allow bacterial invasion. The oldest breeder flock sources often have a higher incidence of yolk sac infection because shell quality and frequency of egg collection both decline. Be alert

to sanded eggs, washed eggs, dirty shells, thin shells and accidental splashing or spraying from humidification equipment onto the eggs.

Assessment areas: Egg pack / egg collection and handling

3. Navel infection / Buttons / Tags / Strings

Many practitioners lump navel infection and yolk sac infection under the heading "omphalitis." And, indeed, by seven days of age, they are indistinguishable from one another. At three to four days of age, the navel may often be clearly identified as the source of infection, before infection becomes overwhelming.

The exterior may have a button, tag or string scab. The interior may be edematous and hemorrhagic, with infection beginning to spread into the yolk sac, which is usually still attached to the abdominal wall.

Problems with navel infection point to overheating in the late incubation or hatching process, which will result in navels that do not heal properly. Poor hatchery sanitation may exacerbate the infection problem. Navel infection may be accompanied by a significant group of dehydrated chicks during the winter because overheating will cause a part of the population to hatch in a weakened state, more susceptible to minor deviations from the thermoneutral zone.

Use examinations of the newly hatched chicks in their boxes and egg breakouts after hatch to find individual machine problems. Seasonal problems may indicate hatchery staff is having difficulty in meeting the manufacturer's requirements for maintenance of machine temperatures throughout the incubation and hatching process since air intake, relative humidity and ventilation within the hatchery are affected by the local environment. Each incubator manufacturer has guidelines for temperature and humidity measurements that will aid in the troubleshooting of this problem. The engineering of the hatchery building and its machines results in different "typical" problems for each type of equipment.

Assessment areas: Incubation / hatching; egg breakout; observation of chicks in box

4. Red hocks, ulcerated hocks

Red hocks are rarely the largest group of chicks, but they will appear with greater frequency when there are problems with excessive humidity and poor moisture loss from set to transfer. In machines that use humidifiers for cooling as well as humidity, the root cause may be overheating, forcing the humidifiers to run too frequently to cool the machines. Careful observation of the metatarsus might reveal mild bowing if the yolk has remained very large throughout incubation. Again, newly hatched chick observations, egg breakout and careful hatchery environment and machine-by-machine temperature and humidity checks may be needed to find the source of the problem.

Assessment areas: Incubation / hatching; egg breakout; observation of chicks in box

5. Aspergillosis

Aspergillosis is characterised by small, round, pinhead-sized (or smaller) yellow-to-white lesions in the lungs. Be careful: chicks with aspergillosis will starve out or dehydrate. Do not miss this key lesion by focusing on the more obvious urates on the kidneys. It is a best practice to check the lungs on every chick to rule out aspergillosis.

When aspergillosis is observed, hatchery sanitation, particularly of the ventilation system, is the place to focus investigation. Aspergillus can be brought to the hatchery on eggs contaminated at the breeder farm and it can be present in the litter on the broiler farm, resulting in individual house infection. But most of the remedial effort will be focused on hatchery sanitation.

Assessment area: Hatchery sanitation

6. Odd problems

Birth defects, dark lungs and injuries rarely cause high mortality. But it is highly unusual to see more than one of these during a typical post-mortem of very young chicks. Birth defects include no eyes, crossed beaks, extra appendages. These indicate incubator problems rather than hatcher problems. Dead chicks have bright, orange-pink lungs. If they have dark red or black lungs, look closely for aspergillosis, and check the navel for signs of an infection that might have become systemic. If those problems do not exist, consider the sanitation of the vaccination equipment and oxygenation of the post-hatch environment.

Injuries (torn skin, crushed feet) are indicators of a chick handling problem, often due to the automated equipment. It takes careful observation of the handling process to discover the "pinch points."

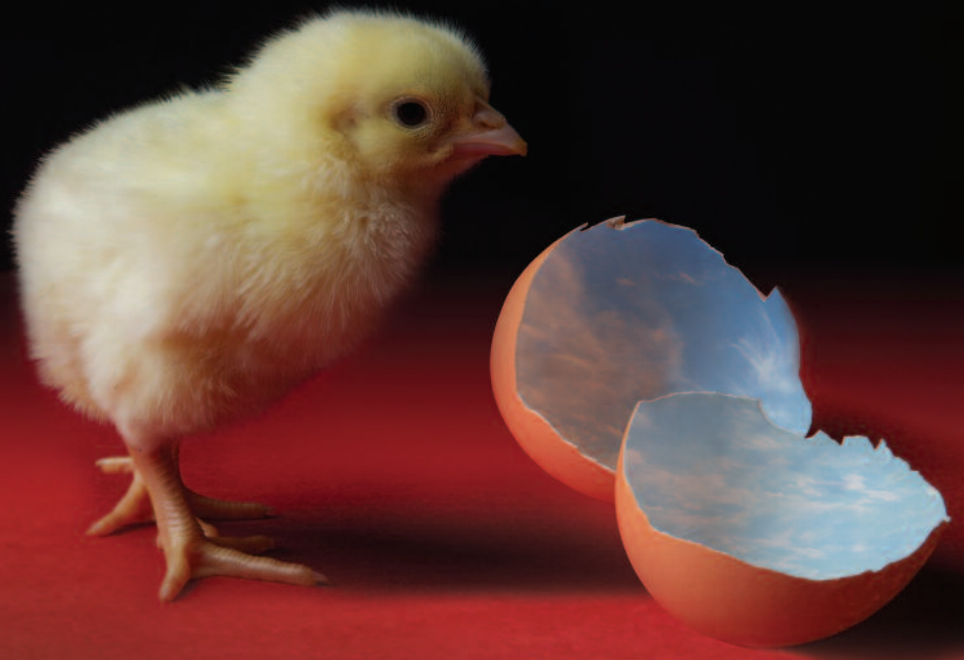
Vertically-transmitted viral diseases or salmonella may cause problems in very young chicks with specific clinical signs. Runting and Stunting Syndrome with cystic lesions in the intestinal villi may also affect very young flocks. Mortality that does not fit into one of the common categories listed will require additional diagnostic investigation, including a check of the proventriculus and gizzard for evidence of ulceration and feed toxicity.

Conclusion

Understanding the most common lesions found in chicks at three to four days of age will help to guide the effort to find and correct common problems. The ability to recognise these lesions and to recognise problems that are outside of the typical lesions expected, will alert the practitioner to situations that require additional diagnostic sampling. ■

CONVENIENCE PROGRAM

AN EARLY START ON PROTECTION FOR A MORE PROFITABLE BUSINESS



GET THE MOST FROM YOUR **VACCINATION PROGRAM**

CONVENIENCE SERVICES

CONVENIENCE AUDIT

Convenience Audit Helps You Benchmark Vaccination Protocols For Best Results

Chick Quality Assessments
Diagnostics
Management Support
Training

MSD Animal Health