Poultry News
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from the team at AgriHealth

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Ionophore Anticoccidials in Broilers
Strategic Use for Sustainable Coccidiosis Control

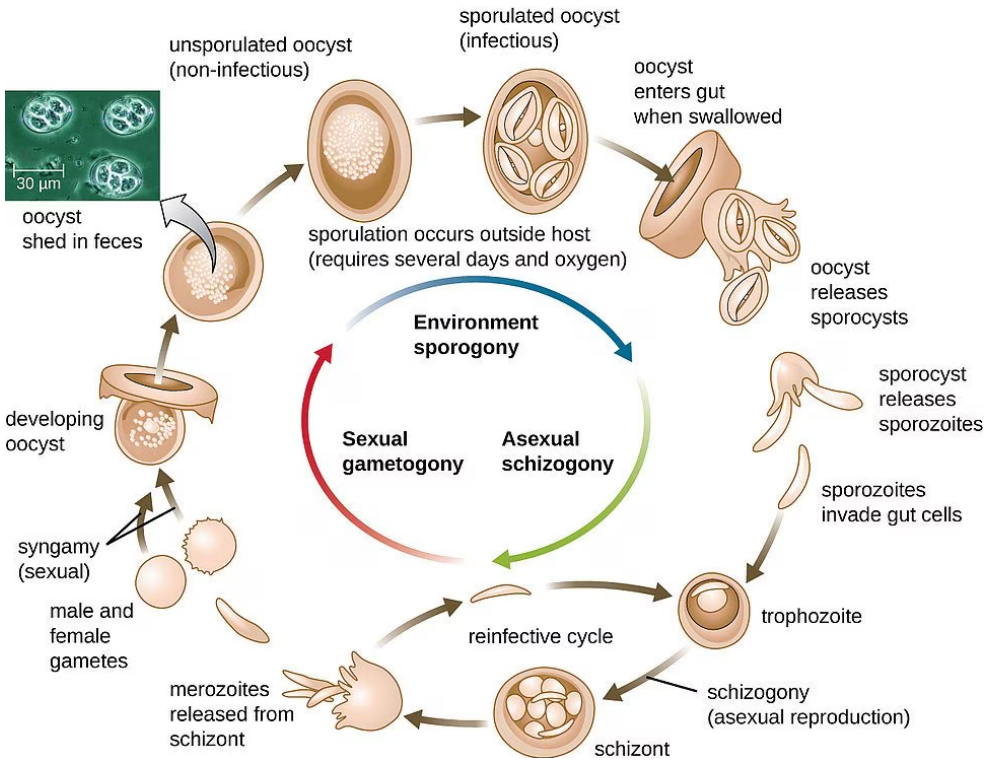
Coccidiosis: A Persistent Enteric Threat

Coccidiosis, caused by various *Eimeria* species, remains one of the most economically significant diseases in broiler production. Intestinal damage caused by this protozoan parasite leads to poor feed conversion, uneven flock performance, reduced growth, and predisposition to secondary conditions such as necrotic enteritis.

For decades, ionophore anticoccidials have been a mainstay in broiler coccidiosis prevention programs. Their ability to limit *Eimeria* replication while allowing partial cycling (to pxromote natural immunity) makes them uniquely valuable in sustainable disease control strategies.

Understanding the differences between classes of ionophores and how to use them effectively, especially within shuttle programs, is critical for optimising bird health and maintaining product efficacy.

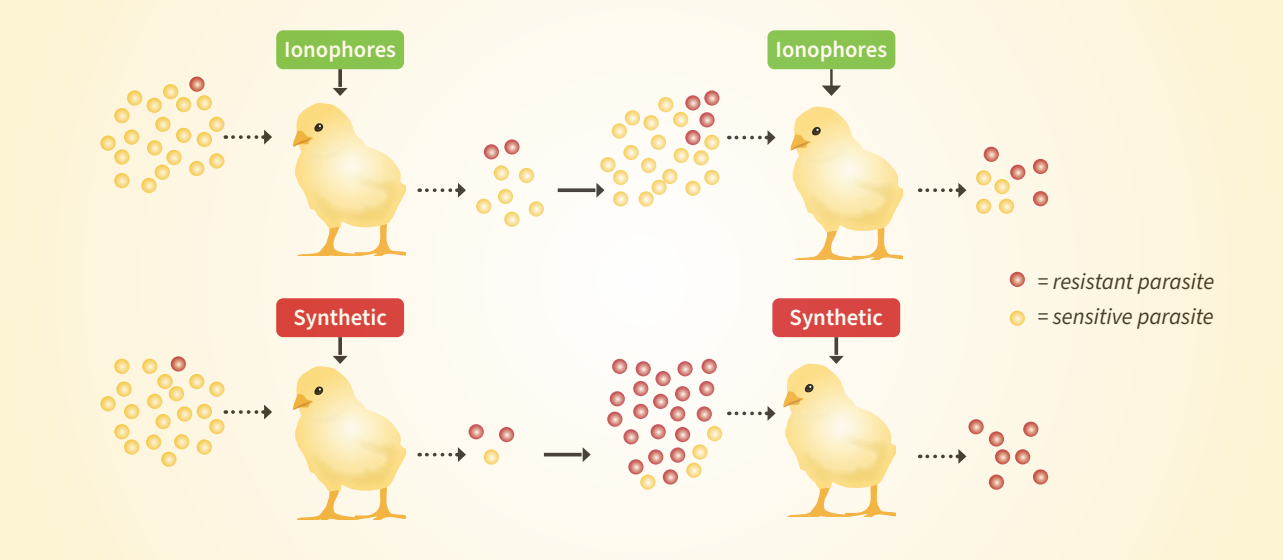
***Eimeria* Life Cycle**



Ionophores: What They Are and How They Work

Ionophores are polyether compounds produced by bacteria. They function by disrupting ion transport across protozoan cell membranes, leading to an osmotic imbalance that ultimately kills the protozoa parasite. These compounds are not used as therapeutic antibiotics, are approved specifically for coccidiosis prevention in poultry feed, and are not used in human medicine.

One key characteristic of ionophores is they do not sterilize the gut, which allows a controlled low level of *Eimeria* exposure. This low level exposure supports the development of active immunity in the bird.



Monovalent vs. Divalent Ionophores: Core Differences

Ionophores are divided into two main classes based on the type of ions they transport:

Monovalent Ionophores

These transport single-charged ions such as sodium (Na^+) and potassium (K^+). Examples include:

- Monensin
- Salinomycin
- Narasin

Sub-class - Monovalent Glycosides

- Maduramycin
- Semduramycin

The strength of monovalent ionophores lies in their broad spectrum and long residual action.

Divalent Ionophores

These transport two-charged ions like calcium (Ca^{2+}) and magnesium (Mg^{2+}), and to a lesser extent, monovalent ions. The most widely used example is:

- Lasalocid

How are Ionophores used in Broiler Coccidiosis Control Programs?

Ionophores are typically administered through feed and are used in three different strategies:

1. Continuous Use

One ionophore is used throughout the full production cycle. While straightforward, this increases the risk of resistance development over time and may reduce long-term efficacy.

2. Shuttle Programs

Different coccidiostats are used at different ages within the same production cycle. A shuttle approach not only broadens protection against multiple *Eimeria* species but also mitigates the development of resistance by alternating modes of action.

3. Combination Use

Combining an ionophore with nicarbazin (early in life) is popular and particularly effective due to the completely different modes of action of the two actives and reduces the likelihood of resistance.

Advantages of Ionophore Use in Broilers

- Broad efficacy against multiple *Eimeria* species
- Support for natural immunity development through partial parasite cycling
- Some ionophores provide added activity against gram-positive bacteria, indirectly helping control necrotic enteritis
- Compatibility with feed-based application for reliable dosing

Limitations to Consider

- Resistance can develop with improper or prolonged use
- Incompatibility with some antibiotics (e.g., tiamulin)
- Requires careful program design and monitoring to maintain effectiveness
- Contra-indications in non-target species
- Shuttling ionophores during a flock cycle reduces options for ionophore rotation between cycles
- Lasalocid increases water intake and often results in wet litter, causing increased risk of footpad dermatitis and pathogenic bacteria challenges, therefore it is best used in summer

Managing Resistance: The Case for Alternating Ionophore Classes

One of the biggest threats to long-term ionophore efficacy is resistance. Although resistance to ionophores develops more slowly than to synthetic chemicals, it remains a real concern, particularly when the same product or class is used continuously.

Key strategies to reduce resistance include:

- Rotation - alternating between monovalent and divalent ionophores (and even monovalent glycosides) every 3 to 6 months
- Implementing shuttle programs within each flock cycle
- Monitoring efficacy of programs through regular lesion scoring
- Periodic anticoccidial sensitivity test
- Ensuring proper inclusion rates and feed mixing

Alternating ionophore classes is particularly effective because it exposes *Eimeria* to different mechanisms of action, reducing the chance of selecting resistant strains.

The Lasalocid - Maduramycin Shuttle: A Proven Strategy

One highly effective shuttle strategy combines the divalent ionophore lasalocid in the starter phase with the monovalent maduramycin in the grower / finisher phase. This approach leverages the strengths of both ionophore classes and provides broad-spectrum control throughout the production cycle.

Phase 1: Lasalocid (0 - 21 Days)

- Divalent ionophore with broad early protection
- Effective against *E. acervulina*, *E. tenella*, and early *E. maxima*
- Mild on gut health and feed intake, supporting chick development
- Helps establish early immune response

Phase 2: Maduramycin (21 Days to Slaughter)

- Potent monovalent ionophore with low inclusion rate
- Strong residual activity against *E. maxima*
- Ideal for later-stage protection when coccidial pressure increases
- Complements lasalocid by extending coverage to later parasite stages

Benefits of the lasalocid - maduramycin shuttle:

- Comprehensive control of major *Eimeria* species across life stages
- Reduction in resistance risk through class alternation
- Consistent weight gain and feed conversion even under challenge
- Enhanced gut integrity and reduced incidence of necrotic enteritis
- Supports long-term sustainability of ionophore efficacy
- Drier litter (compared to lasalocid alone, as lasalocid tends to increase water consumption)

Implementation Tips

- Switch from lasalocid to maduramycin at approximately day 18 - 21, based on field conditions and growth targets
- Ensure precise inclusion levels in feed for both products
- Rotate shuttle programs between cycles to further reduce resistance pressure
- Monitor flock performance and adjust as needed for local *Eimeria* challenges
- Always follow manufacturer guidelines for withdrawal times and compatibility

Conclusion: Smarter Ionophore Use for Healthier Flocks

Ionophores remain essential tools in modern coccidiosis management. By understanding the functional differences between monovalent and divalent types, and using them in well-structured shuttle programs like lasalocid - maduramycin, producers can maintain control over *Eimeria* challenges while preserving long-term efficacy.

The key lies in strategic rotation, careful planning, and regular evaluation. Done right, shuttle programs improve bird health, reduce the need for therapeutic treatments, and enhance economic returns.

Newsletter archive

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