


NORTH AMERICA ISSUE 4
NEW STRATEGIES FOR
ENHANCING POULTRY VALUE
AND PERFORMANCE

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INTESTINAL health



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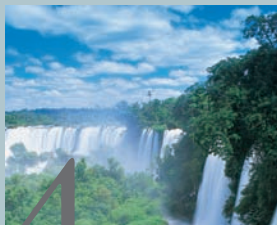
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RESULTS

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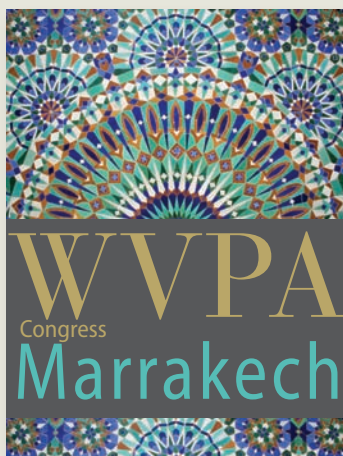
Thought-provoking and memorable quotes from nutritionists, disease specialists and producers.

health

forum

INTESTINAL HEALTH SEMINAR AT WVPA

More than 200 poultry veterinarians and nutritionists attended an intestinal health seminar held at the 16th World Veterinary Poultry Association Congress. Editors from *Intestinal Health* magazine attended the presentations, interviewed the speakers and filed this report.



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special report

CATCH THE LATE SHOW



CATCH THE LATE SHOW

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What harm is a little coccidiosis that shows up late in a broiler's life cycle? Apparently a lot, according to studies by a poultry nutritionist at Oklahoma State University. Field trials show how this work plays out in the real world.



(on the cover)

The production team at Cagle's, Inc., is no longer worried about coccidiosis slowing down their lighter-weight birds. *Intestinal Health* recently visited company farms in Georgia and Alabama for a firsthand look at their new strategy. See page 21. Photo by Joseph Feeks.

opinion: “Real-world results”

Virtually everyone reading this publication is going to be someone who appreciates the importance of research.

However, they're also likely to view research results with skepticism, because we all know that what appears to be a promising new finding often fails when tested in the field.

It is, therefore, gratifying for us to share in this issue an example of research that's proving true in the real world. I'm talking about work conducted by Dr. Robert Teeter of Oklahoma State University. Teeter has spent vast amounts of time testing and studying the impact of coccidiosis on broilers and its economic impact; we've been reporting on his results all along.

He has found that when subclinical coccidiosis occurs late into the production cycle, broilers use more energy and need more feed. There is increased malabsorption, reduced effective caloric value and an elevated maintenance cost.

Subclinical coccidiosis late into the production cycle is seen when anticoccidials are the method of coccidiosis control; oocyst shedding, or leakage, occurs because

coccidia have developed a reduction in sensitivity to anticoccidials.

Teeter has also found that birds near market age with even minor coccidial lesion scores, typical of subclinical coccidiosis, have an average daily gain of about zero. In short, a late coccidiosis challenge significantly hurts flock profitability.

“Now we are pleased to report on a field trial conducted at a broiler farm, which demonstrates that Teeter’s laborious laboratory research is on the mark.”

DR. RICK PHILLIPS

In contrast, a coccidiosis challenge that occurs early in the production cycle has a minor negative effect, Teeter has found. An early challenge occurs when coccidiosis vaccination is administered at 1 day of age, enabling broilers to develop lifelong immunity against coccidiosis at a young age.

Now we are pleased to report on a field trial conducted at a broiler farm, which demonstrates that Teeter’s laborious laboratory research is on the mark.

The results of the trial, presented at a meeting by consultant veterinarian Linnea Newman, show that broilers on in-feed anticoccidials had extremely high coccidial oocyst counts during the later part of the production cycle — and their weight gain was zero. The producer switched to using the live-oocyst coccidiosis vaccine Coccivac-B for a few cycles, which seeded poultry houses with oocysts that are still highly sensitive to anticoccidials.

By the third cycle of vaccination, oocyst cycling was earlier, oocyst counts were lower and weight had improved 240 grams, compared to the first flock on anticoccidials.

When the producer returned to using anticoccidials — after the three cycles of coccidiosis vaccination — the results were amazing: Weight gain improved over 450 grams.

Read the details on Teeter’s latest findings and the broiler field trial that proves his work true in our special report beginning on page 26.

Rick Phillips, DVM

US Poultry Director

Intervet/Schering-Plough Animal Health

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An industry trend watcher based in Brazil thinks the future is bright for poultry producers open to new ideas.



Foz do Iguaçu



Poultry producers stand to reap major rewards despite the challenges they face in coming years, predicted Osler Desouzart, an international consultant on meat production.

Desouzart pointed out that poultry's popularity as an animal source of protein has grown phenomenally. Since the mid-1900s, the accumulated growth in poultry production has been a staggering 2,049% — three times faster than the growth rate for pork and 8.7 times faster than beef, he said.

As the demand for poultry has increased, so has the industry's success in finding ways to grow birds more quickly and more efficiently, a success that Desouzart describes as remarkable. "We've made more progress in the past 10 years than our forbearers did in the previous 10,000," he said.

Consumer values have also changed; consumers are more interested in how products differ from one another in quality and wholesomeness, he said.

Tips for future success

For success in the future, Desouzart advised poultry producers to focus on quality, creating value in their products, and on generating facts and data and making them available to consumers.

"You also need to be open to doing things in new ways and taking advantage of the latest developments in science and technology, including medications and vaccines," he said. "The integrators who are the most successful will be those that embrace change rather than resist it."

Also important for success will be fostering cooperation with competitors to push the growth of the poultry industry as a whole. "You'll find the most success if you hunt as a group," Desouzart said.

innovation^s

New ideas, trends, products and technologies

! More news you can use

Although intestinal health in broilers is the focus of many presentations and field trials in modern poultry operations, the editors and this magazine's sponsor, Intervet/Schering-Plough Animal Health, recognize that there are many other diseases out there — infectious laryngotracheitis, Newcastle disease and Marek's, just to name a few — that also have a significant impact on bird health and performance. Food safety and protecting consumers against salmonella and other food-borne pathogens are also critical.

For that reason, Intervet/Schering-Plough is now producing three newsletters to supplement *Intestinal Health* magazine. *Broiler Health* picks up where *Intestinal Health* leaves off, focusing primarily on respiratory protection and immunity management for broilers and broiler-breeders, as well as food safety. As their names imply, *Layer Health* and *Turkey Health* focus on similar issues specific to layers and turkeys.

Like *Intestinal Health*, the newsletters represent Intervet/Schering-Plough Animal Health's effort to provide timely, educational information aimed at improving flock health in a concise, easy-to-read format.

challenges that egg producers face as they strive to comply with new federal regulations aimed at improving control of *Salmonella enteritidis*.

And in *Turkey Health*, Canada's Dr. Lloyd Weber, a veterinarian and turkey producer, reviews how disease control can boost flock performance in both conventional and antibiotic-free flocks.

The print editions of *Broiler Health*, *Layer Health* and *Turkey Health* are currently distributed in the US only, but producers in other markets can access copies for free through the Intestinal Health Center for Poultry website (ihc-poultry.com) or through boilerhealth.com, layerhealth.com or turkeyhealth-usa.com.

So, if you haven't already, go to ihc-poultry.com/IHNA4 and check out the newsletters. You can also sign up for free subscriptions.

"These publications are yet another example of our commitment to providing our customers with the latest technical information, ideas and strategies for managing flock health," says Dr. Charlie Broussard, Intervet/Schering-Plough Animal Health's US poultry technical service director.



For example, in the latest issue of *Broiler Health*, producers learn how one large producer eliminated femoral-head necrosis in heat-stressed broilers by switching from a live to a recombinant Newcastle disease vaccine.

In *Layer Health*, Dr. Eric Gingerich of the University of Pennsylvania discusses the



research watch



Vaccination more effective than anticoccidial drugs

Vaccination is a more effective way to control coccidiosis than drugs and may become less expensive in the future by making use of cross-protection between some *Eimeria* species, Herman Peek of the University of Utrecht, the Netherlands, says in his doctoral thesis.

Peek demonstrated that on Dutch, German and Spanish poultry farms, the *Eimeria* parasites that cause coccidiosis are often resistant to anticoccidial drugs.

In contrast, vaccination has proved to be a very effective strategy against coccidiosis; in addition, there is an association between vaccinating with parasites sensitive to anticoccidials and a reduction in the number of resistant parasites on farms, Peek says in his thesis, entitled “Resistance to anticoccidial drugs: alternative strategies to control coccidiosis in broilers.”

Investigation of ibuprofen, protease and a prebiotic as coccidiosis-control methods indicated they have limited anticoccidial effects and cannot be considered effective alternatives to current treatments, Peek says in his thesis, according to a report on thepoultrysite.com.

He believes that it may eventually be possible to produce coccidiosis vaccines that are less expensive and more effective if further research can demonstrate cross-protection among *Eimeria* species, enabling fewer species to be included in coccidiosis vaccines or the dosage to be reduced. Broilers vaccinated at 1 day of age with an *E. acervulina* vaccine line had complete protection against a challenge with *E. acervulina* but also partial cross-protection against *E. tenella*; there was no

protection against *E. maxima*, however, he says.

Peek points out that coccidiosis remains common, resulting in significant economic losses due to reduced feed-conversion efficiency, slower growth, increased mortality and expenditures for prevention and treatment.

Caution urged when feeding DDGS, canola to broilers

Feeding distillers’ dried grains plus solubles or canola meal could impair performance and carcass yield, investigators cautioned at the International Poultry Scientific Forum in Atlanta.

In their controlled experiment, 1-day-old male heritage broilers were fed different levels of either distillers’ dried grains plus solubles (DDGS), canola meal or DDGS along with canola meal. The diets were formulated to be similar in calories and met the digestible amino acid requirements of broilers. Performance was evaluated up to 48 days of age and carcass characteristics were measured, said Byoungyun Jung, of the University of Georgia, and colleagues.

Up to 12% DDGS in the diet, the maximum amount tested, did not significantly affect bodyweight gain or feed intake but negatively affected feed efficiency. Including 7.5% canola meal did not significantly affect feed efficiency but significantly reduced bodyweight gain and feed intake compared to controls.

Canola meal also negatively affected the yield of carcass, tenders and legs. In addition, including DDGS or canola meal led to a reduction in breast-meat yield, although the difference was not statistically significant compared to controls.

There was no interaction between DDGS and canola meal on performance or on the carcass characteristics measured, they said.

‘Bio-antibiotics’ improve feed conversion

Using green algae, Italian scientists say they’ve developed a new strain of antibiotics that can be used as a growth promoter without the detrimental effects of products that are currently banned in some countries.

“We have discovered a green algae type that only grows in certain bays along the Italian coast that form the basis for a micro bio-chemical factory,” says Philippa so Molto, of the Italian Istituto di Ricerche Scioccheze, Milan.

The investigator and his colleague, Dr. Antonio di Sapiaone, inserted genes for production of several different therapeutic proteins that are currently made in yeast, bacteria and mammalian cells.

The resulting “bio-antibiotics” considerably improved feed conversion in broilers, and they do not induce resistance or end up in manure and the environment because they are completely broken down during digestion, according to a report on WorldPoultry.net.

In addition, the production system for the bio-antibiotics does not require expensive laboratory and fermentation equipment, since algae grow abundantly in the saline waters of the Mediterranean Sea and subsist on sunlight and carbon dioxide in the air, the investigators say.

The researchers don’t elaborate on the active ingredients or their manufacturing procedures because they have filed for registration and a patent.



WVPA

Congress

Marrakech



Intervet/Schering-Plough Animal Health sponsored a daylong seminar on intestinal health topics at the 16th World Veterinary Poultry Association Congress, which was held in Marrakech, Morocco.

The seminar included several timely presentations that apply to broiler operations in North America. Editors from *Intestinal Health* magazine attended the presentations, interviewed the speakers and filed this report. A special report on the importance of managing coccidiosis leakage in growing broilers begins on page 26.

To view copies of the presenters' PowerPoints, visit the Intestinal Health Center for Poultry at www.ihc-poultry.com.

Dr. Linnea

Newman

Consider house conditions, management to get best results with coccidiosis control

1

Good coccidiosis control and consistent flock performance can be achieved flock after flock, but house conditions and management need to be considered to get the best results, said Dr. Linnea Newman, a consulting veterinarian for Intervet/Schering-Plough Animal Health.

“Coccidiosis is a dynamic, fluid process within the chicken house that can be affected by flock density, litter moisture, in-feed anticoccidials or vaccination,” Newman said.

Coccidial-oocyst output increases with each sequential life cycle after birds become infected. When bird density is higher, so are litter moisture, coccidial multiplication and the coccidial challenge, she said.

What this means regarding coccidiosis control, she said, is that in-feed anticoccidials have a greater challenge in higher density, small-bird systems. Conversely, lower bird density means less moisture in the house and less oocyst multiplication. Chicks also produce less litter moisture than older birds, so that when in-feed anticoccidials are used, the challenge generally tends to peak later in the life of a broiler flock.

Climate and ventilation are other factors that affect litter moisture. Winter is often a time

of low ventilation, higher house moisture and higher coccidiosis challenge. Thus, we tend to see more coccidiosis challenge during winter and early spring, and in-feed medications don't perform as well, Newman said.

Litter moisture is also a function of litter material and depth. Deep wood shavings can act like a sponge, while thin litter leaves nowhere for moisture to go. Straw can mat at the surface, holding moisture at bird level. Higher moisture translates into more coccidia.

“Look at the litter style and management in your poultry houses and try to understand how it will affect the success or failure of coccidiosis control,” she said.

Control with anticoccidials

In-feed anticoccidials, Newman continued, work by suppressing the coccidial life cycle.

The goal with a chemical anticoccidial is to completely suppress the coccidial life cycle, but only resistant strains survive to reproduce and the bird does not develop immunity

continued



Dr. Linnea

Newman



1

Establishing an intentionally managed, early and mild lesion pattern is the best way to achieve uniform and sustainable performance that lasts for years, not just for one rotation.

against coccidiosis. “Resistance happens quickly,” she said.

Ionophores reduce the coccidial reproductive rate but don’t stop reproduction. Coccidial populations will slowly build over time, and immunity is finally achieved if birds live long enough before slaughter. The immunity induced by ionophores may be incomplete since different coccidial species multiply at different rates.

A typical chemical-ionophore program has some oocyst leakage — oocyst shedding — but as long as the total oocyst count stays below 20,000 oocysts per gram at shedding’s peak, “I consider this to be good control,” Newman said.

When sensitivity is lost, however, the parasites have more multiplication in the intestine and more oocysts are shed in the feces. The peaks become higher with continued use of the same drug. “When this occurs, we must consider the interaction of coccidial leakage and environmental conditions. The leakage will occur late — after 28 days of age. And the degree of coccidial leakage will depend upon seasonal moisture conditions and

stocking density. Control will fail most quickly in high-density, small-bird operations or during winter and early spring for any size bird,” she said.

Newman cautioned that when reduced sensitivity occurs, it is often not obvious to the producer. Birds can look perfectly normal and there are no typical signs of coccidiosis, no mortality nor even any abnormal feces.

“More of the coccidia are escaping the suppressive effect of the anticoccidial and they are reproducing. Oocyst peaks are higher and are usually delayed to 4 or more weeks of age. The result is decreased performance during the seasons when coccidiosis is more difficult to manage,” she said.

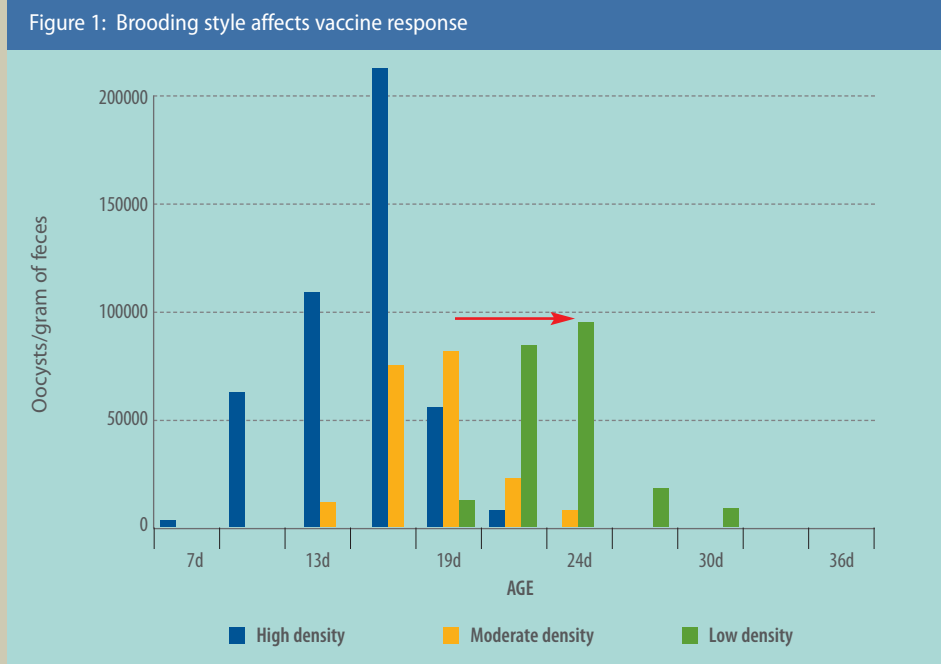
Control with coccidiosis vaccines

Broilers vaccinated against coccidiosis at 1 day of age shed oocysts 4 to 7 days after vaccination. The chicks then ingest and recycle the vaccinal oocysts, a process that initiates lifelong immunity against coccidiosis, Newman explained.

“Different vaccines, however, require a different approach to management,” she emphasized. For instance, the live-oocyst vaccine Coccivac-B for broilers contains mild, natural strains and initiates a pattern that’s similar to that which occurs with wild strains. Immunity in broilers from vaccination with Coccivac-B is complete after 3 to 4 *Eimeria* life cycles.

Full immunity after using Coccivac-B takes multiple coccidial life cycles. For instance, *Eimeria acervulina* and *E. mivati* produce massive numbers of oocysts and immunity develops quickly, while *E. maxima* has a lower reproductive rate and immunity can take 3 to 4 recontamination cycles to develop. *E. tenella* falls somewhere in between, taking about 3 recontamination cycles to develop full immunity.

Natural-strain coccidiosis vaccines, like Coccivac-B, result in mild lesions, and oocyst shedding peaks when stocking density is from low to moderate. In contrast, a precocious-strain vaccine used with low- to moderate-stocking densities may fail to cycle effectively enough to induce immunity before wild challenge levels can



Lower density causes the shedding pattern to move to the right; peaks at lower density will occur in older birds.

build. High stocking density and wet litter favor the coccidiosis life cycle, so Coccivac-B may produce moderate lesions and higher oocyst shedding peaks, while a precocious vaccine responds well to these conditions, she said.

This example demonstrates that with a live coccidiosis vaccine, “you can manage your immunity pattern,” she said (Figure 1). “You can drive immunity harder or reduce reactions, as needed, with management changes; the goal, ultimately, is to minimize the intestinal insult in broilers,” Newman said.

The moderate density pattern indicated in Figure 1 in gold is the more desirable pattern for achieving consistent and uniform performance. It is the easiest to manage from season to season, and it is sustainable once the pattern is established, she said.

Establishing an intentionally managed, early and mild lesion pattern is the best way to achieve uniform and sustainable performance that lasts for years, not just for one rotation.



Dr. Marshall

Putnam



Updated strategy improves coccidiosis control and yields added perks for Wayne Farms

2

A new coccidiosis-control strategy that incorporates vaccination has improved disease control and yielded additional, unexpected benefits for a major US producer.

Wayne Farms used to depend on an ionophore-leakage program and the buildup of coccidial oocysts in the litter to initiate immunity in its broilers, according to Dr. Marshall Putnam, director of health for the Georgia-based company — the fifth largest poultry producer in the US, processing roughly 5.6 million birds weekly from eight live-production complexes.

“We used to typically run starter feed up to about 18 days of age and the maximum ionophore level, trying to get birds off to a good start,” he explained. “Then we’d switch to a grower feed and a lower level of ionophores to promote leakage at around 19 days of age, and we’d run that up to around 40 days of age.”

Wayne, which primarily produces large birds, was “very set on trying to get immunity developed in these birds,” the veterinarian

added, noting that the company used a withdrawal feed after 40 days.

Everything seemed right with the coccidiosis-control program until 2000, when Wayne started using diclazuril, a chemical anti-coccidial that was new to the US poultry industry. “We immediately picked up 4 to 6 points in feed conversion [at some of the complexes], and that got everybody’s attention because it was a significant improvement in cost for us,” Putnam said.

Ultimately, resistance to diclazuril developed and the results weren’t as good, but the experience demonstrated that Wayne Farms had been losing performance with its ionophore program, prompting the company to scrutinize its coccidiosis-control program. It took a look at Coccivac-B, the live coccidial-oocyst vaccine developed by Intervet/Schering-Plough Animal Health.

Successful in small-bird complex

“As it stands now, all of our complexes have used the vaccine,” Putnam said. Some still rotate the vaccine with ionophores, but four

used the vaccine all year in 2009 and even a small-bird complex was “very successful” using the vaccine over winter.

He cautioned that initiating use of a coccidiosis vaccine requires educating farm managers carefully. “They get real nervous because they are held accountable for performance at their complexes,” Putnam said. “They don’t expect the vaccine to work as well as an anticoccidial because they’ve had it drilled into their heads that we don’t want any coccidia. Well, Mother Nature’s going to find a way — the birds are going to get coccidia at some point in their lives; what we’re trying to do with the vaccine is dictate when they get it.”

Putnam also warned that flocks coming off anticoccidials early are going to have late coccidial-oocyst leakage. “Then, when you put a vaccine in, you’re going to have some problems with your first vaccine cycle,” he added. “There could be a necrotic enteritis outbreak. Performance is going to go up and down, but it’s going to get better.”

By the second vaccine cycle and beyond, performance continues to improve as the oocyst load in the house stabilizes, he

said, noting that Wayne Farms still uses built-up litter.

Putnam added that changes in performance tend to be blamed on the coccidiosis-control method — particularly if it’s a vaccine — when, in fact, the real problem could be house management during hot weather. For that reason, Wayne Farms has tried to schedule vaccine use so that the first cycle of vaccinated birds is sold at a time that does not coincide with stressful weather, Putnam said.

Wayne Farms has also used in-feed antibiotics during the first cycle of Coccivac-B after ionophore use, to support gut health during the transition, he noted.

The company has determined that coccidiosis vaccination is effective based on results at posting sessions and on broiler performance. Posting sessions reflect how birds are cycling coccidia and correlates with performance, he said.

With the old ionophore program — when the maximum possible amount was used, then

continued

“By the second vaccine cycle and beyond, performance continues to improve.”

DR. MARSHALL PUTNAM



Dr. Marshall

Putnam



2

“I think a lot of people in the US overlook the immune system status of their flocks, but it’s critical and it’s the foundation for any [effective] coccidiosis-control program.”

DR. MARSHALL PUTNAM

dropped down to a lower level in the grower feed to save on costs and promote immunity — “we couldn’t save enough to make up for lost performance,” Putnam said.

Immune system status important

He emphasized the importance of broiler immune status. “I think a lot of people in the US overlook the immune system status of their flocks, but it’s critical and it’s the foundation for any [effective] coccidiosis-control program,” Putnam said. House management is likewise important, since bird stress can “blow the immune system out of birds.”

Putnam said he tracks coccidial-cycling patterns closely. At posting sessions, “I tell my folks that I don’t really care what they’re seeing at 15, 16 or even 22 days of age...I get nervous if there’s cycling at 35 or 38 days of age and +1 or +2 lesions,” since research has shown that even minor coccidial lesions have a negative impact on bird performance.

After several years of experience with coccidiosis vaccination and rotating the vaccine with an in-feed anticoccidial program, Putnam said he no longer wants

to see a bump up in performance after the switch to a vaccine. When ionophores are used, a lower level is provided in the starter feed, and a higher level is provided in the grower feed — the opposite of what the company used to do. “I want those birds to get leakage in their first 2 or 3 weeks of life,” he said. “Then I’m going to put the maximum level on them during the growing phase.”

As a result, the transition from ionophores to the vaccine is smooth, and “we’ve seen absolutely no change in performance from one week to the next” because the oocyst load in the house isn’t as great for vaccinated birds, he said.

Use of the vaccine restored the efficacy of ionophores, and “we’re not seeing any issues with drug resistance,” Putnam said.

An unexpected benefit was the elimination of gangrenous dermatitis. This condition, caused by a subacute clostridial infection, was resulting in mortality. But “when we went to the vaccine, the problem stopped,” he said.



Dr. Aris

Malo

Multiple factors
can trigger
necrotic enteritis
development

3

Control of necrotic enteritis requires attention to multiple factors that can trigger the disease, ranging from coccidiosis to the amount of protein in feed, said Dr. Aris Malo, global technical manager, Intervet/Schering-Plough Animal Health.

The leading cause of necrotic enteritis (NE) is the alpha toxin secreted by *Clostridium perfringens*, an opportunistic bacterium that needs the right environment to flourish and wreak havoc in the chicken's gut, Malo said. In recent years, health surveys indicate that NE has become one of the top five concerns among poultry producers. The disease is also costing the global poultry industry millions of dollars annually.

NE may be subclinical or clinical. Economic losses from subclinical NE occur due to lost weight gain and growth as well as impaired feed conversion, while the clinical form causes increased morbidity and mortality. The disease also predisposes birds to secondary infections and increases time to market, he said.

Damage to the intestinal mucosa may be only a slight thickening, as occurs with

subclinical NE, or severe necrosis, which occurs with clinical NE. In a normal gut, the villi are elongated, finger-like structures that extend out to the lumen; in a gut ravaged by NE, villi are shortened and have wide gaps between them. In some cases, the villi appear to be melted together. "You can imagine the big reduction in the absorptive surface of the intestines," he said.

Broilers with NE also tend to have ballooning in the gut, since *C. perfringens* is gas forming. Another consequence is cholangiohepatitis, evidenced by an enlarged liver with a yellowish-bronze color, which results in condemnations, Malo said.

Clostridia like high pH

The veterinarian pointed out that clostridia can be found throughout the environment, including soil, dust and feed, and these bacteria are a normal part of the gut flora of all animals. Clostridia like a high pH, and, consequently, farms located in areas with high

continued



Dr. Aris

Malo



3

An important trigger for development of NE is clinical or subclinical coccidiosis.

concentrations of limestone report a higher incidence of NE compared to other areas.

An important trigger for development of NE is clinical or subclinical coccidiosis. Coccidial lesions in the gut initiate increased mucus production. "It's the gut trying to protect itself, but you could say it has the opposite effect because mucus is also food for clostridia," he explained. "If the clostridia are the type that produces toxins, it also causes more damage to the gut and more mucus. It turns into a vicious cycle."

It's no coincidence that NE tends to occur during the later half of the production cycle, which is the same time that flocks on anticoccidials experience oocyst leakage if coccidial resistance has developed, he continued. Besides NE, flocks may develop other conditions associated with clostridia, such as gangrenous dermatitis.

The second half of the production cycle is the worst time for birds to develop harmful gut conditions because "that's when they put on the meat. That's when you're going

to have a high impact on your production performance," Malo said.

He also cited a controlled study conducted at the University of Georgia demonstrating that NE mortality is worse if birds are challenged with coccidiosis.

Other NE triggers

Other triggers for the development of NE include reduced antibiotic sensitivity when in-feed antibiotics are used; high-protein diets, which supply clostridia with certain amino acids that the bacterium needs; and high levels of animal byproducts, particularly fish meal, which can be heavily contaminated with clostridia spores. High levels of wheat, rye and barley have been associated with the development of NE because they are coarse grains, which can irritate the gut and be difficult to digest, resulting in more nutrients for clostridia organisms and more mucus production. In addition, a change in feed can irritate the gut, making it a favorable environment for clostridia, Malo said.

When edible types of litter such as rice or oat hulls are used, they are consumed by birds, increasing ingestion of coccidia and bacteria and setting the stage for development of NE, he noted.

Measures that can reduce the incidence of NE in flocks at risk for the disease include feeding a lower protein diet, with more synthetic amino acids. Byproducts of questionable quality should be avoided, as should grains such as wheat and edible types of litter. Enzymes and microflora treatments that improve digestibility may be helpful, he advised.

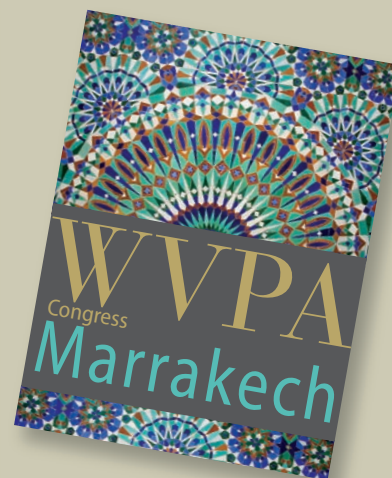
Besides nutrition and management changes aimed at minimizing the risk for NE, another option is the use of a Clostridium type-A toxoid developed by Intervet/Schering-Plough Animal Health. To date, the vaccine has been used under a conditional license by producers in the US and Canada growing antibiotic-free birds and was recently approved for use in the EU. Two doses are administered to hens, which pass immunity against NE to their offspring.

The vaccine reduces mortality from NE and the incidence and severity of lesions due to *C. perfringens* type-A-induced NE. The vaccine has resulted in improved livability, improved weight and improved feed conversion, Malo said.



“If the clostridia are the type that produces toxins, it also causes more damage to the gut and more mucus. It turns into a vicious cycle.”

DR. ARIS MALO



Dr. José

Barragan



Proper nutrition the first 15 days of life helps ward off enteritis

4

Enteritis in broilers is most likely to strike from 15 to 30 days of life but can be warded off with good nutrition the first 2 weeks after hatch, said poultry nutrition specialist and consultant Dr. José Barragan, of Spain.

Dr. Barragan, who described the broiler's intestines as a "complex ecosystem," said that it takes about 15 days for the bird to develop a mature bacterial population.

"This is one of the reasons why broiler nutrition is so important during the first 15 days of life," he said.

A top priority should be providing food that broilers will eat, Barragan continued. When there's a problem related to nutrition during the first week of life, it's often the physical presentation of the feed. He recommended micropellets because broilers will usually eat them readily. In addition, studies show that adding red dye to feed will further encourage eating.

The level of vitamins and sodium should be adequate, Barragan said, noting that, "It's a good idea to increase the level of sodium because broilers will drink more, and if they

drink more, they'll probably eat more, too." Amino acids are important, probably more so than the level of protein, he noted.

The 'dangerous phase'

The 15- to 30-day stage of life is "the dangerous phase," Barragan continued, because that's when enteritis can develop. Broilers that had normal but perhaps wet droppings from 10 to 12 days of age develop big, wet droppings at about 15 to 18 days; then at 20 to 22 days of age they have evidence of undigested food in wet litter and orange droppings. The birds generally recover by age 32 to 35 days.

During the 15- to 30-day period, digestible raw materials in the diet are imperative. "If you reduce the ability of the broiler to absorb raw materials, you are creating conditions that ultimately will produce the problem of enteritis because food not absorbed by the bird will be used by bacterial populations," Barragan explained. He cited a study demonstrating that if the quality of raw materials is reduced during this phase, the result is reduced performance reflected in

less-than-optimal weight gain and feed conversion.

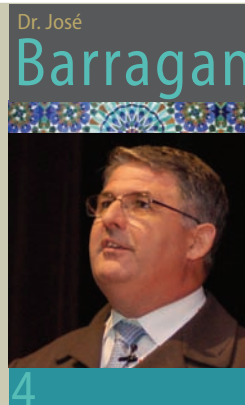
Identifying a digestion problem

Because many factors can lead to changes in the bacterial population and to enteritis — ranging from peristaltic movements to bacterial spores in the feed — it isn't always easy to determine when nutrition is contributing to the problem. However, one way to help identify diet as a contributor is to test the level of protein and fats in feces.

"If you find an increase in the level of protein or fat in the feces, you know that you have a digestion problem and you need to check your raw materials," Barragan said. "The idea is to adapt dietary formulations to the broiler gut. Don't wait for broilers to adapt their gut to the diet."

The nutritionist also recommended the use of feed additives that improve the balance of intestinal microflora and a less dangerous bacterial population.

"The idea is to adapt dietary formulations to the broiler gut. Don't wait for the broilers to adapt their gut to the diet."
DR. JOSÉ BARRAGAN



If the gut of broilers is healthy by the time birds are 30 days of age, enteritis isn't going to be a problem, nor is the quality of raw materials as important as it is earlier in life, he said.

Nevertheless, problems such as coccidiosis can occur during the end of production that can impair final weight gain. "Subclinical coccidiosis is a very dangerous problem at the end of the production time," he said, so "avoid the fate of coccidiosis, hence, necrotic enteritis."

Asked to elaborate on normal protein and fat levels in the feces of broilers, Barragan said what's important is a change in levels. "If you usually have a protein level of about 12% and then it suddenly jumps to 16%, then you know you've got a digestion problem; the same applies to fats," he said.





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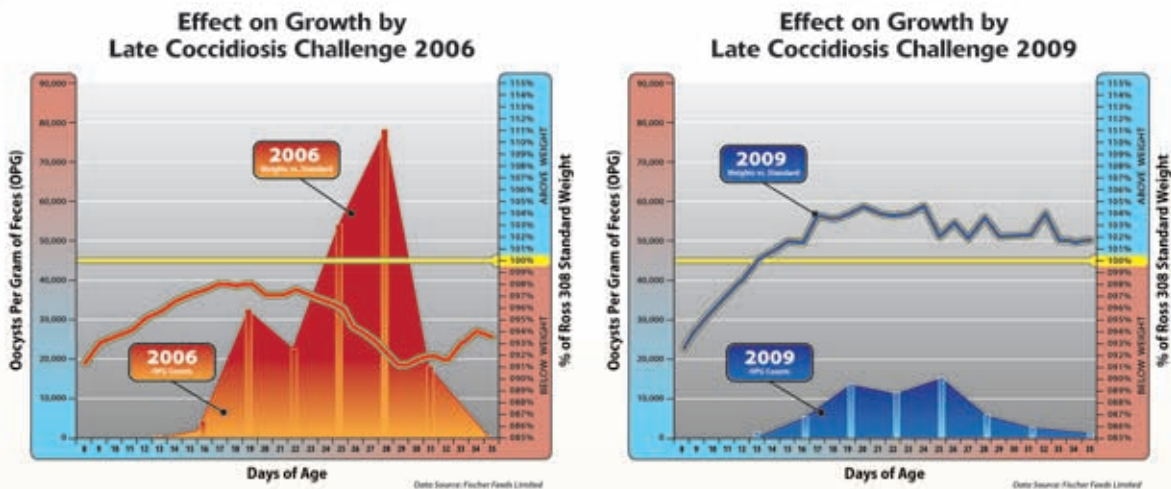
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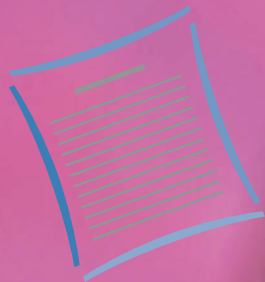
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Clockwatchers

CAGLE'S, INC.

Never mind days
to market.
At Cagle's, Inc.,
where most
broilers are grown
to only 3.75 to
4.30 pounds,
they'd prefer to
measure a bird's
life in hours.



“Those birds live 840 hours, which leaves us very little room for error or setbacks of any kind,” says Brad Harp, vice president for live operations. “It’s sort of like drag racing. If you miss second gear, you’ve already lost the race.”

Live-operations manager Rick Tullos agrees. “On birds that size, if you lose 8 hours of growth to disease or stress, that’s like 1% of the bird’s life. At that point, it’s all over but the crying.”

Producing seven to eight cycles of lighter-weight birds requires intensive management involving many variables — some predictable, some not. But for the production team at Cagle’s, maintaining good intestinal and respiratory health is key to the livability and performance of its birds.

‘Gut with a pair of lungs’

“It might sound a little crude, but to me, a chicken is basically a gut with a pair of lungs,” Harp says. “If we can keep both of those things healthy, feed our birds good nutrition and put them in the right environment, the rest is like falling off a log.”

Harp says respiratory diseases haven’t been a big issue in recent years. “But it wasn’t until recently that we realized how many problems we were having with intestinal

health,” he concedes. “And they’ve been costly, too.”

Stopping the leak

Cagle’s had changed to its normal summer program in 2008, when it experienced a widespread and severe outbreak of gangrenous dermatitis. “We had 93% livability,” Tullos says. “Or, put another way, we were losing 7% before we could get them to market. That wasn’t acceptable.”

Gangrenous dermatitis is a costly disease that causes necrosis of the skin over the wings, thighs, breast and head in growing birds. It’s not an intestinal disease, per se, but outbreaks of the disease have been linked to resilient coccidia left uncontrolled by ionophore anticoccidials.

The evidence is circumstantial, but a growing number of producers have observed that birds vaccinated with Coccivac-B don’t develop gangrenous dermatitis. The vaccine itself doesn’t prevent the infection, but it is known that vaccinated birds don’t experience the late subclinical coccidiosis that can sometimes occur with feed medications.

To help stop dermatitis in its tracks, Harp and Tullos devised a two-pronged plan of attack designed to prevent coccidiosis leakage associated with the dermatitis.

continued



ABOUT CAGLE'S

Cagle's, headquartered in Atlanta, Georgia (US), has farms and two processing plants in western Georgia and Alabama.

Until recently, when the company opted to produce 6-pound broilers at one plant, it processed more than 2.2 million birds a week, ranging from 3.75 to 4.3 pounds.

Much of its product from lighter-weight birds goes to chicken tenders sold at fast-food restaurants, as well as small roasted chickens available at supermarkets and delicatessens — an expanding market for the company for several years.

For more on the company, go to cagles.net.

First, they switched all broilers that were already in the field to a chemical anticoccidial at 18 days to shut down the coccidia organisms that weren't controlled by the ionophore used in the starter feed. At the same time, they started vaccinating all day-old chicks entering the system with Coccivac-B.

“For us, it was like flipping on a light switch,” Tullos says. “We started flocks on Coccivac-B and the dermatitis went away — gone! — and our livability increased from 93% to 97%. Improvements like that usually don't happen that fast in live production. Normally, it takes time for change to have an effect, but this was almost instant.”

‘Couldn't keep the litter dry’

With dermatitis behind them and fall approaching, Harp and Tullos decided to stop vaccinating after two cycles. The plan was to switch to a new ionophore for one cycle and then rotate to nicarbazin in the starter and grower feeds for the winter program. But they never got that far. After 4 weeks on the ionophore, their birds started showing signs of coccidiosis.

And it got worse, quickly.

By December they experienced a coccidiosis outbreak in birds that were just days from being processed. Livability plunged to as low as 75% on one farm.

“Cocci was bleeding through the ionophore program pretty badly. We just couldn't keep the litter dry. It was like soup,” Harp says. “It was so severe, we considered euthanizing birds in two houses. Fortunately, switching to the chemical nicarbazin shut it down right away.”

Better health, uniformity

The following spring, Cagle's started vaccinating all birds with Coccivac-B to improve coccidiosis control — and this time it vaccinated for five cycles. Better health wasn't the only advantage to vaccinating birds. Harp and Tullos also noted that the vaccinated birds grew more uniformly. “They looked like widgets punched out of a factory press,” Tullos says. “It was amazing.”

Their contract growers noted the improved health and uniformity as well. When Cagle's eventually went back to using feed medications for coccidiosis control, producers protested and said they “wanted more of those pink birds,” Tullos says, referring to the sprayed-on vaccine's red dye. The dye, which eventually wears off, encourages early preening and distribution of the coccidial oocysts in the sprayed-on vaccine.

After using the vaccine for five cycles in 2009, Cagle's switched back to using feed

continued

“Cocci was bleeding through the ionophore program pretty badly. We just couldn’t keep the litter dry. It was like soup.”

BRAD HARP



'SEEDED DOWN PRETTY HOT'



While all poultry operations are likely to experience coccidiosis leakage after prolonged use of in-feed anticoccidials, Harp thinks that raising birds to 35 days sets up the house for hotter strains of coccidia, which usually finish cycling at 28 to 35 days.

“If you’re keeping your birds to 53 days and you’ve got coccidiosis buttoned up, you’ve got about 20 days when there are no oocysts being shed,” he says. “But in a small-bird program, you’re pulling that bird at 34, 35 days. It’s just barely quit shedding, if it’s quit shedding at all.”

“After using ionophores and pulling those birds at 35 days for so often and so long, I think we had our litter seeded down pretty hot.”

Vaccinating with Coccivac-B has helped to cool it off. The vaccine contains live coccidial organisms isolated decades ago, before in-feed anticoccidials were used. The oocysts stimulate the birds’ natural immunity. Vaccinal oocysts are then shed by birds — a process that repopulates the house with a controlled, balanced dose of traditional, more manageable strains.



medications in the colder months — a period when its growers “tighten up on ventilation,” Tullos says, making it harder to keep the litter dry and increasing the challenge from coccidiosis.

“We don’t have our growers where we want them yet on ventilation for using Coccivac-B year-round, but that’s an option to consider for the future,” Tullos adds.

Cagle’s hasn’t used an ionophore for coccidiosis control since December 2008. “After a couple of years, we might consider them again, but Brad and I are pretty gun-shy,” Tullos says. “On the other hand, we’ve been very happy with the vaccine.”

Not for big birds only

Harp and Tullos also dismissed early concerns about birds experiencing a momentary setback following vaccination and not being able to make up the loss before processing.

“We initially lost some ground in feed conversion, but we were told that would happen and it was only in the first round,” Tullos says. “But you’ll gain it back over the cycles that you stay on Coccivac-B.”

For example, birds on the first round of Coccivac-B had a feed-conversion rate of 1.78 pound per pound of gain. By the third round, feed conversion improved to 1.72.

More importantly, they say, vaccinated birds had lower mortality than medicated birds and also grew more uniformly, which makes them easier to process.

“All those concerns in the past about using Coccivac-B in small birds, they don’t bother me anymore,” Harp says. “And another thing — there’s no [feed medication] withdrawal time to cause concern,” which provides more processing flexibility.



“We initially lost some ground in feed conversion...but you’ll gain it back over the cycles that you stay on Coccivac-B.”

RICK TULLOS



BUILDING EARLY IMMUNITY

Pleased but still puzzled by the dramatic results with Coccivac-B, Harp and Tullos contacted Dr. Charlie Broussard, poultry technical service director for Intervet/Schering-Plough Animal Health, the company that makes the vaccine.

The veterinarian cited work by Dr. Robert Teeter, a nutritionist at Oklahoma State University, who’s shown that introducing a controlled, balanced dose of coccidial organisms early in the bird’s life with Coccivac-B stimulates a bird’s natural immunity to the disease with minimal impact on performance.

On the other hand, the study showed that uncontrolled coccidial challenges later in the bird’s life — such as those caused by coccidia leakage — were a big blow to flock health and performance. (See related story, page 26.)



CATCH THE LATE SHOW



What harm is a little coccidiosis that shows up late in a broiler's life cycle? Apparently a lot, according to studies by a poultry nutritionist at Oklahoma State University.

In this special report, *Intestinal Health* looks at the most recent research on this topic and how results in the lab are consistent with what's happening in the real world.



CATCH THE LATE SHOW

Late coccidiosis challenge has ‘profound’ impact on profits

A coccidiosis challenge late in the production cycle has a profound, negative effect on energy utilization, flock performance and profitability — even when coccidial gut lesions are minor, indicates expansive research by a US nutritionist.

“I have never conducted a nutrition study with the order of magnitude that this study revealed about the impact of intestinal health on energy utilization,” Dr. Robert Teeter, of Oklahoma State University, said during a talk on the economic impact of subclinical coccidiosis in broilers.

His findings, which are being borne out in the field (see article, page 30), show that when broilers experience a coccidiosis challenge late in the production cycle, they use up more energy and need more feed compared to birds challenged with coccidiosis early in the production cycle. The result is increased malabsorption, reduced effective caloric value and an elevated maintenance cost, Teeter said.

The researcher and his team measured the effect of coccidial lesions on energy utilization, also known as the “caloric cost,” with the aid of indirect calorimetry chambers. His lab at the university has 60 of the chambers — the largest set for small animals anywhere in the world. The chambers enable measurement of values such as oxygen consumption and carbon dioxide production in real time as birds are exposed to various stressors such as coccidiosis.

Teeter also uses an X-ray densitometer (DEXA) unit to noninvasively scan birds and quantify protein, fat, water, ash and energy content. “[This technology] gives us a very complete picture of what’s happening with growth and performance,” explained the nutritionist, whose work is in part sponsored by Intervet/Schering-Plough Animal Health.

Gross lesions in the experiments are evaluated with the widely accepted Johnson-Reid Lesion Evaluation Score, which ranges from zero, indicating no intestinal lesions, to four, the most severe lesions.

Study with Cobb broilers

Teeter’s most recent experiment involved 936 Cobb male broilers raised to 48 days of age. The birds came from a variety of coccidiosis-control programs, so they had varying degrees of immunity to coccidiosis.

At weekly intervals, groups of the birds were moved for 6 days to the metabolic chambers and were challenged with an oral dose of *Eimeria acervulina*, *E. maxima* or *E. tenella*, three coccidial species known to wreak havoc in poultry complexes; some birds received sterile water and provided a control.

The composition of the birds — the protein, fat, water, ash and energy content — was measured before and after chamber placement with the aid of the DEXA unit. Teeter assessed bird performance and metabolism to create a broad performance-lesion score. He also measured the



ROBERT TEETER

“I have never conducted a nutrition study with the order of magnitude that this study revealed about the impact of intestinal health on energy utilization.”

DR. ROBERT TEETER

effects of lesion scores on calorie expenditure (caloric cost) and contrasted the effects of early versus late lesion scores on performance and dietary caloric-density cost.

Overall, performance declined as lesion scores went up. For instance, in birds with a higher lesion score, metabolizable energy (ME) declined. For 800-gram (1.76-pound) birds, ME consumption declined about 25% with a lesion score of 2, and in older, 3,000-gram (6.61-pound) birds, it fell 30%.

The heavier, older bird challenged with coccidiosis “gets hit really hard, comparatively speaking, in weight gain, feed efficiency and so forth,” Teeter said, adding that “not only does the younger bird have less of a

physiological and metabolic impact, it also has more time available for compensatory gain.”

Average daily gain decreased about 1.5% of bodyweight in grams for each increase in the coccidiosis score, Teeter continued. At the end of the 6-day period in the metabolic chambers, average daily gain fell 40% in the 800-gram (1.76-pound) birds with a lesion score of 2, and in the 3,000-gram (6.61-pound) birds with a lesion score of only 2, there was no gain at all (Figure 1).

“Gain was eliminated for these birds, so depending on how many of them you have in your population in the field, it’s going to have a very marked influence on performance,” he said.

These findings indicate that a 2,000-gram (4.4-pound) bird with a lesion score of 1 is going to be gaining 30 grams (0.06 pound) less per day; if it has a lesion score of 2, it will gain 60 grams (0.13 pound) less per day, he said.

Effect on feed efficiency

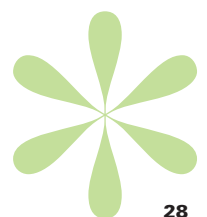
The effects of coccidial lesions on feed efficiency were similarly negative. Each increase in the coccidiosis lesion score was associated with a decrease in feed efficiency of 0.0084% of bodyweight. Put another way, the feed-conversion ratio increased from 2.0 to 3.02 in a 2,000-gram (4.4-pound) bird.

continued

Figure 1: Average daily gain decreased 40% in 800-gram (1.76-pound) birds with a lesion scores of 2.



Predicted ADG	@ 800 g	@ 3000 g
Score 0	71.7	91.7
Score 1	63.9 (-10.9%)	48.9 (-46.7%)
Score 2	42.6 (-40.6%)	-0.18 (-101%)





Late coccidiosis challenge has 'profound' impact on profits

ROBERT TEETER

With the aid of an energy model that predicts ME consumption and by looking at kilocalories — which is 1,000-gram calories — lost in excreta, Teeter also determined that the 800-gram (1.76-pound) birds were losing almost 31 kcals of extra energy a day if they had a coccidial lesion score of only 2. Older, 3,000-gram (6.61-pound) birds were consuming a little over 650 kcals of energy a day, indicating a good appetite, but there were many more malabsorbed calories — almost 84.

“So there’s a very, very high loss from malabsorbed calories and this just demonstrates the importance of intestinal health in a growing broiler,” Teeter said. “Those intestines have to indeed be healthy for these birds to be able to extract those calories appropriately.”

If producers want to achieve a bodyweight of about 2,500 grams (5.51 pounds), it’s going to take about 39 days and an ME consumption just shy of 14,000 kcals in an ideal production environment. However, when stresses such as coccidiosis present themselves, they steal energy. The bird responds by either eating more feed to compensate or by diverting calories away from what it consumed, in which case it gains less weight. “You’d have to purchase extra feed for the bird to utilize with no return on investment in the form of body tissue to market,” Teeter explained.

He emphasized that in addition to coccidiosis, management factors affect energy expenditure in broilers. Lighting, for instance, reduces bird heat production about 24%; a properly administered lighting program increases

the effective caloric value, or the caloric density of the diet, while a poorly managed lighting system steals energy from broilers.

Pellet quality likewise affects dietary caloric density. Compared to a mash, feeding 100% pellets results in an additional 187 kcals of energy, or less energy expended. “The more birds rest, the less time they spend eating, the more efficient they are at eating and the less energy they expend on activity,” Teeter said.

Based on the massive amount of data produced by his study, the researcher concluded that lesions resulting from a coccidiosis challenge are associated with significant energy and performance costs. The consequences of these lesions are markedly elevated during the grower-finisher phases versus the starter phase of production.

An early coccidiosis challenge, as occurs with coccidiosis vaccination administered at 1 day of age, has a minor negative effect on feed consumption, average daily gain, live-weight yield, feed conversion, maintenance energy costs and malabsorption. When the same stress presents late in the growth curve, as occurs with in-feed anticoccidials, there is a major negative impact on all of these factors, Teeter said, noting that, “You especially want to consider malabsorption in that mix.”

“When coccidiosis challenge occurs during the final 2 weeks of the growth cycle, even minor lesions can significantly reduce flock profitability,” he added.

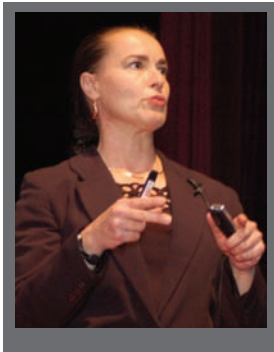




CATCH THE LATE SHOW

Field experience shows perils of late coccidiosis challenge

LINNEA NEWMAN



Real-world experience is corroborating research indicating that a coccidiosis challenge late during the production cycle takes a far more serious toll on broilers and the producer's wallet than an early coccidiosis challenge.

According to research by nutritionist Robert Teeter, a late coccidiosis challenge has a major negative impact on performance and flock profitability, while a challenge early in the production cycle has a minor negative effect (see accompanying article).

Now field data from a commercial poultry farm is proving the research true, said Dr. Linnea Newman, a consulting veterinarian with Intervet/Schering-Plough Animal Health.

The veterinarian described a trial conducted by a broiler producer in Ontario who implemented coccidiosis vaccination on his farm because he wanted to develop an antibiotic-free line of birds; he also wanted to see if vaccination renewed coccidial-oocyst sensitivity to in-feed anticoccidials.

The trial involved five flocks raised to ages 35 to 36 days. The producer collected oocyst samples and took daily weights on in-house scales. Anticoccidial control in the flocks consisted of the following:

- * Flock 1: Nicarbazin-narasin
- * Flock 2: Coccivac-B vaccine, no antibiotics
- * Flock 3: Coccivac-B vaccine, no antibiotics
- * Flock 4: Coccivac-B vaccine, no antibiotics
- * Flock 5: Return to narasin anticoccidials

Birds that were vaccinated received Coccivac-B, a live-oocyst vaccine, at 1 day of age in the hatchery via spray cabinet. The vaccine initiates immunity to coccidiosis during the first weeks of the bird's life, then provides lifelong protection against the disease.

Extremely high oocyst counts

The first flock, which received in-feed anticoccidials, had extremely high coccidial-oocyst counts during the later part of the production cycle but no clinical signs, which is typical of subclinical coccidiosis. They had been gaining weight, as expected, according to the Ross standard, but weight then fell off significantly — by 292 grams; during the last 3 days, they had zero weight gain.

Dr. Teeter's research has shown that birds near market age with subclinical coccidiosis, represented by coccidial lesion

continued



Field experience shows perils of late coccidiosis challenge

LINNEA NEWMAN

scores of only 2, have an average daily gain approaching zero — and that's exactly what happened in the Canadian field trial, Newman said.

In Flock 2, which received no in-feed anticoccidials but was vaccinated against coccidiosis, oocyst counts weren't taken but weight gain improved. Flock 3, which also received the vaccine, still had high oocyst counts, but peak shedding was shifting to a time earlier in the production cycle; these birds also had improved weight gain.

High oocyst counts, Newman explained, are the result of carryover from the previous flock that was on anticoccidials. Anticoccidials allow leakage of resistant coccidial oocysts, which are still in the house and hard to destroy, Newman said. When birds instead receive a coccidiosis vaccine, the house is gradually seeded with coccidial oocysts that have never been exposed to anticoccidials and are still sensitive to anticoccidials, but it takes a few cycles, which is reflected in the Canadian trial and by experience at Wayne Farms in the US (see article, page 11).

By Flock 4 and the third cycle of vaccination in the Canadian trial, "we've fallen into a complete vaccination pattern," Newman continued. Oocyst cycling was earlier

and the oocyst counts lower. Weight improved 240 grams compared to Flock 1 that received in-feed anticoccidials

Astounding weight improvement

For Flock 5, the producer returned to the use of anticoccidials, which were once again effective. The difference in weight gain between the first flock and the fifth was an astounding 452 grams (0.996 pound). "That's huge. Dr. Teeter's research was correct. There's a lot to be lost if you have coccidiosis late in the production cycle," Newman said (see Figure 1).

"It's those last 2 weeks of the flock where most of our feed is going to be consumed and it's when most of the muscle mass is being put on. That's the money part of the bird," she added.

The field trial results also bolster Teeter's finding that for every increase in the coccidiosis lesion score, average daily weight decreases by 1.5% of bodyweight, Newman added.

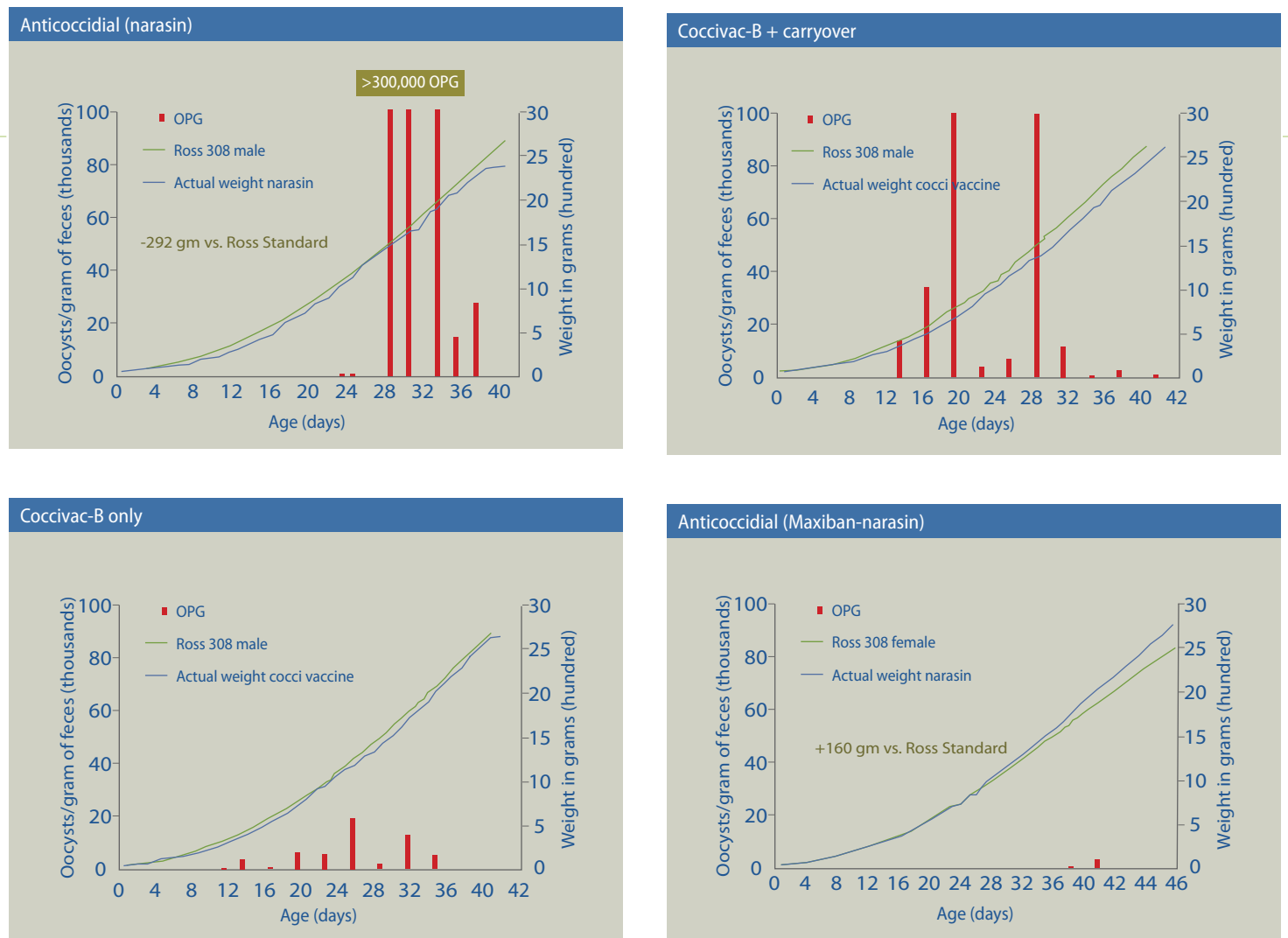
She also presented recent data from another Canadian producer who has used Coccivac-B continuously.

continued

“Know what your coccidiosis challenge looks like. If oocyst counts are high, you won’t get maximum performance from your birds.”

DR. LINNEA NEWMAN

Figure 1: Integration of Coccivac-B into the coccidiosis-control program for three cycles shifted oocyst cycling to a time earlier in the production schedule, restored oocyst sensitivity to anticoccidials and substantially improved weight gain.



DIFFERENCE = 452 GRAMS



Field experience shows perils of late coccidiosis challenge

LINNEA NEWMAN

“This further demonstrated that once we establish the immunity pattern, stop the carryover effect and seed the house with vaccine strains, coccidiosis tends to become very much more predictable, lower, consistent, and that’s the goal,” the veterinarian added.

Late subclinical coccidiosis, she said, can have a measurable, negative impact on performance. “Dr. Teeter’s mathematical models really seem to do a good job of offering a measure of economic impact; they seem to be real under field conditions.”

Vaccination reduces challenge

Vaccination, Newman continued, “offers an opportunity to manage your coccidiosis challenge. Establishment of an early, consistent immunity pattern is going to eliminate carryover and stop that cycle of resistance-building. It’s going to reduce the overall coccidiosis challenge and will give you the opportunity to renew sensitivity to in-feed anticoccidials.”

Vaccination, which can be used for broilers at any slaughter weight, is a process with a long-term goal, she emphasized.

The oocyst shedding that occurs with in-feed anticoccidials tends to peak at about 4 weeks of age, close to market age. If slaughter age were at 63 days, as it was 20 years ago, then an oocyst-shedding peak at 28 to 35 days wouldn’t matter. “At this moment, though, our coccidiosis peak and our slaughter age are directly on top of each other, and our peaks are increasing because we’ve lost sensitivity to the anticoccidials,” she said.

Another factor to consider is that cleanout and disinfection aren’t effective against coccidia. The overall numbers in the house can be reduced if the litter is removed, but generally it’s not possible to kill coccidial oocysts, Newman said.

“Know what your coccidiosis challenge looks like. If oocyst counts are high, you won’t get maximum performance from your birds. Keep in mind that our flocks aren’t breaking with coccidiosis and this isn’t complete resistance. It’s just high oocyst counts, reflecting subclinical coccidiosis. They’re minor lesions, but as Dr. Teeter’s research and field experience demonstrate, they can have major consequences,” she said.



worth repeating



I think that for a grower who's dealing with dermatitis, coccidiosis vaccine would certainly be one of the options he would want to consider."

DR. JOHN SMITH
FIELDALE FARMS
BALDWIN, GEORGIA



The development of self-limiting immunity, which eventually protects a flock, is a very critical objective for a coccidiosis-control program...

DR. GREG MATHIS
SOUTHERN POULTRY RESEARCH
ATHENS, GEORGIA



The feathering, the bodyweight, the skin pigmentation, the uniformity — all of these parameters relate to intestinal health...

DR. RAMIRO DE GASPERÍN
CARUS ABELLA
CORDOBA, VERACRUZ, MEXICO

INTESTINAL health

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