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NEW STRATEGIES FOR COCCIDIOSIS MANAGEMENT



**PERFORMANCE SHOWDOWN:
VACCINES VS. IN-FEED ANTICOCIDIALS**

PLUS

MAKING THE SWITCH AT THE FEED MILL

CP BANGKOK ADDS VALUE WITH VACCINATION

DR. H. DAVID CHAPMAN: NEW ROTATION OPTIONS



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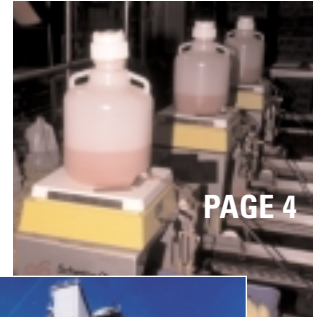
Schering-Plough
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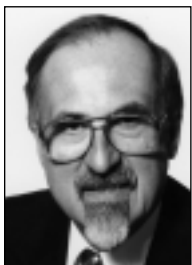
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KEEPING A LEVEL HEAD

Vaccinating birds for coccidiosis is hardly a new concept. In recent years, however, new administration methods and the trend toward growing larger birds have made this a more practical, reliable and profitable means of coccidiosis prevention.

More importantly, coccidiosis vaccination is providing a valuable tool for reducing or, in some cases, even eliminating in-feed anticoccidials. This has not only solved resistance problems associated with continuous use of ionophores, but it is helping top poultry operations add value and increase export demand for their products. (See story about CP Bangkok, page 8.)

Because of disease pressure, not every producer should completely eliminate in-feed anticoccidials. For many operations, however, using potent, synthetic anticoccidials such as diclazuril and rotating them with a vaccine will help tailor

control programs to shifting oocyst populations. (See Dr. H. David Chapman's ideas, page 10.)

Lastly, it's important to keep a level head when managing products for coccidiosis. Always rotate with a specific objective in mind (i.e., changing oocyst populations and increasing susceptibility to drug or vaccine use) and use feed additives judiciously. Schering-Plough Animal Health, for example, recommends using its new anticoccidial, diclazuril (Clinacox™), for no more than two consecutive cycles. We want the product used responsibly, keeping one eye on the problem at hand and the other on the future. It's this type of strategic approach to disease management that ultimately will prevail in the war against coccidiosis.

T. Michael Schwartz

T. Michael Schwartz, DVM
Director, Worldwide Technical Service - Poultry

TYING THE SCORE

Performance of vaccinated birds equals or exceeds birds receiving traditional in-feed coccidiostats

Recent studies with roasters and broilers finished in as little as 42 days indicate that performance of poultry immunized with a coccidiosis vaccine is just as good as in birds that continuously receive an in-feed coccidiostat.

“We’re finding that with live oocyst vaccination, we’re coming closer to the same kind of productivity you’d find in the field with use of in-feed anticoccidials,” says Dr. Harry Danforth, parasitologist with the USDA’s Agricultural Research Center, Beltsville, Md.

In a study conducted by Dr. Danforth, weight gain and feed efficiency in roasters that received a live oocyst vaccination initially lagged behind those fed an anticoccidial. This was expected because birds are exposed to oocysts, or coccidia organisms, in the vaccine that ultimately enable the birds to develop immunity against coccidiosis.

Performance in vaccinated birds, however, caught up to that of the in-feed group. By the end of the study, there was no statistically significant difference in weight or feed efficiency between the two groups of birds, which were grown 56 to 63 days, Dr. Danforth says.

The results showed not only that vaccination with live oocysts elicited “significant protection” against coccidiosis, but that it resulted in “average bird weight gains and feed efficiency similar to that obtained with conventional anticoccidial medications,” Dr. Danforth concludes (*Int J Parasitol* 1998 Jul; 28 (7):1099-109).

Results Similar in Broilers

The results were similar in broiler studies conducted by researcher Dr. Greg

Mathis of Southern Poultry Research, Inc., Athens, Ga.

In Dr. Mathis’ study, presented last year at the American Association of Avian Pathologists conference, some birds received the live oocyst vaccine at hatching and other, nonvaccinated birds were fed the anticoccidial salinomycin in starter and grower feeds. The broilers were housed in a floor pen facility and managed as they would be in a commercial operation.

“The weights from the two programs were identical. In fact, in the field trials, weight and feed conversion among vaccinated birds were sometimes better than those of broilers receiving salinomycin.”

Dr. Greg Mathis
Athens, Ga.

At day 14, average feed conversion and live weights were similar in the vaccine and salinomycin groups. By Day 21, an effect on performance due to coccidiosis vaccination occurred and the vaccinated group trailed behind the nonvaccinated group in weight and feed conversion.

However, by day 28, performance in the birds receiving the anticoccidial



had declined and there was no significant difference in weight gain or feed conversion between the vaccinated and in-feed groups. Performance in both groups remained the same for the remainder of the study, Dr. Mathis says.

Field Data Confirm Results

Field data provided by Schering Plough Animal Health, the company that manufactures Coccivac®-B, a live oocyst vaccine, confirmed the results of Dr. Mathis' floor pen studies.

Commercial flocks raised in high temperatures during summer received either the vaccine or an in-feed anticoccidial.

"The weights from the two programs were identical. In fact, in the field trials, weight and feed conversion among vaccinated birds were sometimes better than those of broilers receiving salinomycin," Dr. Mathis says.

The field studies included 5- and 6-pound broilers and demonstrated that vaccination can be used for smaller broilers grown to 42 days, as well as those grown to 49 days of age.

Previous studies have shown that vaccinating birds against coccidiosis causes some intestinal disruption and resulting performance loss. However, Dr. Mathis says his research shows that the impact on performance is only temporary.


He originally thought that the benefits of vaccination would not outweigh any negative impact on performance, but the trend today is for a longer grow-out period and further processed birds. In this case, the benefits of immunity can equal or exceed any loss in performance, "especially when you take into consideration the cost of anticoccidial medications."

Benefits of Vaccination

The major advantage of using a coccidiosis vaccine is improved coccidiosis control, Dr. Danforth says. Rotating the vaccine with coccidiostats helps combat resistance to the in-feed products,

which is a well-recognized problem in the poultry industry.

"I'd recommend the vaccine to poultry producers where drug resistance is a problem with coccidiosis, but it depends on where you go," he says.

"In some areas, in-feed coccidiostats still work well. In other areas of the U.S., immunization would be a real plus because you aren't getting as good a result with in-feed anticoccidials." 

Spray Cabinet Technology Simplifies Coccidiosis Vaccination in Poultry

Spray cabinet technology makes it easier to administer the live oocyst coccidiosis vaccine and helps assure even distribution, say poultry experts.

"With the spray cabinet, you put 100 chickens in a box and mist them with the vaccine solution," says **Dr. Phil Hargis**, an independent poultry nutritionist based in Batesville, Ark. "It's a lot more likely that the vast majority of chicks will get the vaccine than if workers spray it on feed pans or if the vaccine is administered in water."



Dr. Larry McDougald, parasitologist at the University of Georgia, Athens, says, "We don't have the final say yet on which is the best method of distributing this vaccine, but the newer methods, such as the spray cabinet, are greatly improved over older methods. With water administration, the vaccine isn't distributed properly and exposure is uneven."

Dr. Harry Danforth adds, "The spray cabinet is more likely to be accepted because poultry producers already have spray cabinet technology to treat for other diseases, such as bronchitis."

Other methods can be problematic. Eye administration, for instance, requires individual birds to be handled, which isn't as efficient, he says.

"Better methods of administration may come along, but right now, the spray cabinet is one of the best. It's simpler, quicker and takes less people and time to do it," Dr. Danforth says.

Dr. John McCarty, a poultry veterinarian with Schering-Plough Animal Health, explains that sprayed chicks preen and ingest the vaccine orally, which helps obtain more uniform administration throughout a flock.

'BUSINESS AS USUAL'

Switching to a coccidiosis vaccine doesn't have to cause headaches at the feed mill

Implementing and managing a coccidiosis vaccination program for broilers is not the hassle or logistical nightmare for feed mills that it's sometimes cracked up to be.

In fact, today's computerized systems and sophisticated management make it tough to slip up. Even if mistakes are made, it doesn't necessarily spell disaster.

"In my experience, most modern feed mills in the poultry industry are quite capable of making routine feed changes," necessitated by using a coccidiosis vaccine, says Dr. H. David Chapman, professor of poultry science, University of Arkansas. "It all comes down to quality control."

Feed mill managers who have managed the switch agree.

"As long as the information is entered properly into the computer system and followed by dispatchers, problems shouldn't result," says Doug Helms, live operations manager for Townsend's, Inc., in Arkansas.

"The same problems you could encounter managing a coccidiosis vaccine are the same that could arise no matter what products you are using, including in-feed coccidiostats."

Learning to Juggle

Townsend's began using a live coccidiosis vaccine, Coccivac-B, in broilers 5 years ago to help prevent resistance and improve the response to in-feed coccidiostats, Helms says. The hatchery sprays each flock for coccidiosis for a 6-month period. During that time, in-feed coccidiostats are withheld from the starter, grower and finisher feeds for those flocks. When the hatchery stops spraying for coccidiosis, in-feed coccidiostats are provided in the feed.

"Switching from a coccidiostat to a

coccidiosis vaccine requires some effort," notes Helms, "but no more than any other change at our feed mill," which produces about 4,500 tons of broiler feed per week.



Dr. Linnea Newman, a poultry consulting veterinarian with Schering-Plough Animal Health, says there are two major areas of concern during transition to and from a coccidiosis vaccination program. First, there is a concern that vaccinated birds will receive feed containing a coccidiostat that would destroy the oocysts from the live vaccine and prevent birds from developing immunity. The second concern is that unvaccinated birds will receive feed without a coccidiostat, leaving them open to field challenge.

"The greatest focus needs to be on the starter ration. Vaccine-stimulated immunity to coccidial organisms requires two 7-day cycles for *E. ace-*

Bushong: 'Record keeping is minimized when you don't have a coccidiostat and are not running combination products.'



vulina and *E. maxima*, and three cycles for *E. tenella*. If the feed mill can get the starter ration delivered correctly, most serious problems can be avoided,” she says.

Although normal practice dictates that feed should not be left on the farm for long periods of time, Dr. Newman says it may be necessary to deliver the entire 1.5 to 2 pounds per bird of starter feed to the bins of the last farms that receive birds before the transition is made. This allows the mill to make a clean break and begin delivering the new starter to the first farms after the change.

“High-volume grower rations can’t be delivered all at once, but a single mistaken delivery of grower feed on a given farm is not as likely to cause a problem for vaccinated birds,” she says.

Unvaccinated birds with a mistaken delivery of grower feed may need amprolium treatment, but only if the field challenge level is high, Dr. Newman adds.

It’s Manageable

“Concerns about making the transition to and from a vaccination program are legitimate,” she adds, “but we’ve found that managing feed for a coccidiosis vaccine program is business as usual. If a mistake occurs — and it is rare when one does — it’s manageable.”

Poultry scientists agree that the worst-case scenario would be failing to provide an in-feed coccidiostat to unvaccinated birds.

“I think you’ll get away with it for one flock,” says Dr. Chapman, “unless there are other conditions and diseases that exacerbate coccidiosis. Anticoccidials often are used as an insurance policy anyway to prevent, not treat coccidiosis.”

Adds Dr. Tim Cherry, poultry veterinarian at Stephen F. Austin State University, Nacogdoches, Tex., “The worst-case scenario is that you’d lose some birds and have to medicate the water. You’d also have to remove the

old feed, put in the new feed with a coccidiostat and correct for the next cycle.”

Keep it Simple

To simplify the process and help assure mistakes don’t happen, Townsend’s maintains the same schedule for all its farms. “For instance, when switching from the vaccine to the in-feed treatment, we pick a date,” Helms explains. “After that date, all farms get unvaccinated chicks. The feed mill knows the feed must contain a coccidiostat.”

The procedure is similar at Mississippi-based Peco Farms, LLC, which also rotates a coccidiosis vaccine to prevent the development of resistance to the in-feed products, says Gary Nelson, feed manager.

“We have a cutoff date for the hatchery when it stops spraying for coccidiosis,” he says. “There is one person at the feed mill assigned to notify everyone about that date, and chicks produced subsequently must have an anticoccidial in the starter, grower and finisher feeds.”

The transition does require that feeds with and without an anticoccidial be kept in stock, but it hasn’t been difficult, Nelson says.

“We work with about 100 growers, but it’s not confusing for the feed mill. The feed dispatcher keeps up with the cycle on paper — and it’s in his head,” he says. “Some people would say that switching to the vaccine is a big deal, but it’s not.”

Dr. Rex Bushong, a consulting nutritionist from San Angelo, Tex., who works with Peco, thinks switching to a vaccine will actually make life easier at the feed mill.

“Recordkeeping is minimized when you don’t have a coccidiostat and are not running combination products,” he says. “Operations may experience some confusion in the beginning, but the benefits of switching to a vaccine might help them out long term.”



Newman: ‘We’ve found that managing feed for a coccidiosis vaccine is business as usual.’

KICKING THE HABIT

Consumer demand, increased profits, improved vaccine technology let CP Bangkok produce drug-free, value-added birds for Japan

More than half of the 60 million broiler chickens produced annually by Charoen Pokphand's poultry operation in Bangkok are now raised without feed antibiotics or anticoccidials, reports Dr. Kreetta Khanti, veterinarian and senior vice president.

"We are putting more emphasis on vaccination and environmental controls to control disease," he says. "Over the next few years, as we make further improvements to our facilities, we hope to produce all of our birds without drugs."

The change in CP Bangkok's disease-management strategy is driven by several factors:

■ **Changing consumer demand.** "We want to help resellers add value to their poultry products, while meeting the changing needs of the consumer," explains CP's Anek Bondoon, a senior vice president.

"Today's consumers know a lot about food safety and are particular about how their food is produced," he adds. "This started in Europe and we're now seeing it throughout the Pacific Rim. We want our supermarket customers and other resellers to be ready to meet the growing demand for natural products."

It appears that CP is on the right track. According to one report by the Mid-America International Agri-Trade Council, a regional trade group in the United States, organic food sales in Japan have increased 20%-30% since the 1980s, with total sales expected to reach US\$2.6 billion this year.

The Canada-Japan Trade Council also reports that organic foods are "taking off" in Japan, adding that both

Japanese importers and Japanese consumers are increasingly looking for products produced with no chemical or drug additives.

"The Japanese have long had a heightened awareness of and concern

*CP broiler farm
Kang Koy, Saraburi.*



about their food supply," the report observes. "In addition, they are attracted by the perceived extra tastiness and nutritional value of organic [foods]."

■ **Value-added products.** "We look at our supermarket customers as strategic partners," explains CP's Somboon Denvanich, also a senior vice president.

"Our resellers wanted a strategy for adding value to their products and meeting the needs of these new markets. That is the way to become the market leader. Drug-free birds are helping our resellers reach that goal and obtain a premium price on their products."

■ **Better margins.** According to Denvanich, CP gets a premium of 15% on drug-free poultry. "Finishing time for a 2-kilo (4.4-pound) bird is 45 days, or about 3 days more than when we were using growth promoters and

Denvanich: 'Vaccinating for coccidiosis is now a better option.'



other feed antibiotics,” he says. “Overall our production costs are up about 10%, but we’re getting a 15% premium.”

Producing drug-free birds is also helping CP Bangkok expand. All of its drug-free birds are currently imported by one Japanese buyer, but the company expects demand to increase significantly in Japan and other countries over the next few years.

“We knew that if we wanted to continue exporting to Japan or expand in Europe, we had to move in this direction. We also want to get away from producing a commodity product,” Khanti says. “By taking drugs out of the feed, we give our products added value.”

■ **Advances in vaccine technology.**

In the past, CP’s biggest obstacle in the way of drug-free birds was coccidiosis, which is usually controlled with ionophorous antibiotics or other chemical coccidiostats.

“Vaccinating for coccidiosis is now a better option,” Denvanich says. “It allows us to produce drug-free birds without sacrificing weight gain, conversion or profitability. In fact, switching to vaccination has helped us add more value to our product.”

Dr. Khanti says he was apprehensive at first about removing the coccidiostat from starter and grower rations.

“But the vaccine provides protection for the life of the bird, so we don’t have to worry about coccidiosis breaks,” he says. “It also solved the problems we were having with coccidiostat resistance.”

The vaccine, Coccivac-B, is a live oocyst vaccine that protects against the most economically significant species of *Eimeria* causing coccidiosis in broiler chickens. It is administered to day-old chicks by a specially designed spray cabinet that provides uniform distribution of the vaccine.

The next step for CP is to introduce coccidiosis vaccination to the other 30 million birds in its system that presently get antibiotics. “We’re not ready to eliminate all the drugs from those older contract facilities, but we would like to try rotating the coccidiosis vaccine with

Selecting chicks.



a coccidiostat to reduce drug usage and stop resistance patterns,” Denvanich says.

■ **Better facilities and management.**

New ways of managing birds are also helping CP produce drug-free birds without compromising production. “When you produce this kind of product, you have to watch environmental



Dye in vaccine shows uniform coverage provided by spray cabinet.

controls,” Denvanich says. “The birds also require more intensive care during the first two weeks of age.”

Dr. Khanti says birds are placed at a stocking rate of 12.60-13.50 per square meter (3.28 square feet) in houses with evaporative cooling systems. The litter

continued on page 15



Dr. H. David Chapman
Department of Poultry Science
University of Arkansas

STRATEGIC USE OF COCCIDIOSTATS AND LIVE VACCINES IN COCCIDIOSIS CONTROL

Outbreaks of coccidiosis — recognized by obvious intestinal lesions and excessive mortality — occur less frequently in modern poultry operations than they did in the past. Nevertheless, subtle effects of the disease, such as reduced growth rate and impaired feed conversion, continue to reduce the performance and profitability of commercial birds.

Over the years, sound management practices, sanitary procedures and a broad range of anticoccidial feed additives have all helped to control coccidiosis. Still, *Eimeria* parasites remain widespread in U.S. poultry flocks, mostly because the parasites have developed resistance to most in-feed coccidiostats after prolonged usage. It is therefore important to continually seek improved methods of coccidiosis control.

Managing Immunity

Traditional approaches to coccidiosis control aim to identify the most effective drug in order to achieve optimal control of the disease. In the past, a succession of new drugs was introduced enabling a producer to select the most effective agent. Few truly new products have appeared in the last decade, however, and it has become increasingly difficult to benefit from the “new drug effect” usually seen with novel anticoccidials.

In recent years, an alternative approach involving the use of drugs that allows immunity to develop has become more popular. Recent research has shown that although drugs such as salinomycin do not prevent the acquisition of immunity, this process takes time and solid immunity is not acquired until birds are 6 to 7 weeks of age.

The development of immunity under these circumstances depends upon the accidental exposure to infective oocysts in the environment. Acquisition of immunity also depends on the frequency and duration of exposure to infection, the species of *Eimeria* present, and environmental and management factors.

Natural exposure to infection cannot be guaranteed, so controlled exposure by intentional immunization (using live coccidiosis vaccines) is more appropriate if immunity is desired. The recent introduction of a new method of coccidiosis vaccination — spray cabinet in the hatchery — has made this more practicable for broiler production.

Reliance upon immunity development in medicated birds has the disadvantage that reduced performance due to subclinical coccidiosis may occur if birds are exposed to high levels of infection early in life before immunity has developed.

New Tools, New Strategies

The U.S. poultry industry’s newest coccidiostat, diclazuril (Clinacox, Schering-Plough Animal Health), has a unique mode of action and provides broiler operations with an alternative method of control. The synthetic anticoccidial is effective against all species of *Eimeria* as evidenced by greater suppression of lesions in the intestines compared with other drugs. Diclazuril is also able to completely suppress oocyst production (Fig. 1), thereby reducing the risk of subclinical infection. It is therefore ideal for reducing infection levels or “cleaning-up” commercial houses.

When used in rotation programs with other anticoccidials, diclazuril will

Reprinted from the proceedings of the CocciForum symposium held April 11, 2000, at the Arkansas Poultry Federation conference, Springdale.

not only improve efficacy, but its “clean-up” effect should help improve the efficacy of other drugs. This is important because other feed additives used for coccidiosis control — ionophorous antibiotics such as salinomycin, monensin, narasin and semduramicin — belong to the same family of drugs and have a similar mode of action. As a result, strains of coccidia resistant to one drug show reduced sensitivity to the others.

In order to suppress these resistant strains, it is necessary to use a drug with an unrelated mode of action. Diclazuril is effective against ionophore-resistant strains and strains resistant to various “chemical” drugs such as amprolium, clodolol, robenidine, halofuginone and zoalene (Fig. 2). Ideally, diclazuril should be used with the flock following litter removal, as this should help reduce the numbers of any drug-resistant organisms.

Judicious Use

The consequences of feeding the same anticoccidial for prolonged periods are well known and almost always result in a progressive decline in efficacy. This has been demonstrated with the ionophore monensin, where strains of *E. acervulina* isolated from breeder farms (where the drug had never been employed) were more sensitive to the drug than strains from broiler farms with a long history of ionophore usage.

Like ionophores and other established coccidiostats, diclazuril has the potential to become less effective when used continuously. It is therefore important to understand its limitations and use it judiciously.

Trials were conducted to compare *E. tenella* resistance buildup to diclazuril with a quinolone (to which resistance develops rapidly) and amprolium (to which resistance develops slowly). After 10 generations, a reduction in sensitivity to diclazuril

was observed (Fig. 3). However, the rate of development of resistance was more comparable with amprolium than with the quinolone.

It is clear that resistance to diclazuril will develop with prolonged use, just as it has to other coccidiostats. However, using the new anticoccidial responsibly will help to preserve the product’s “clean up” power. ▶

Figure 1. Effect of diclazuril on oocyst production

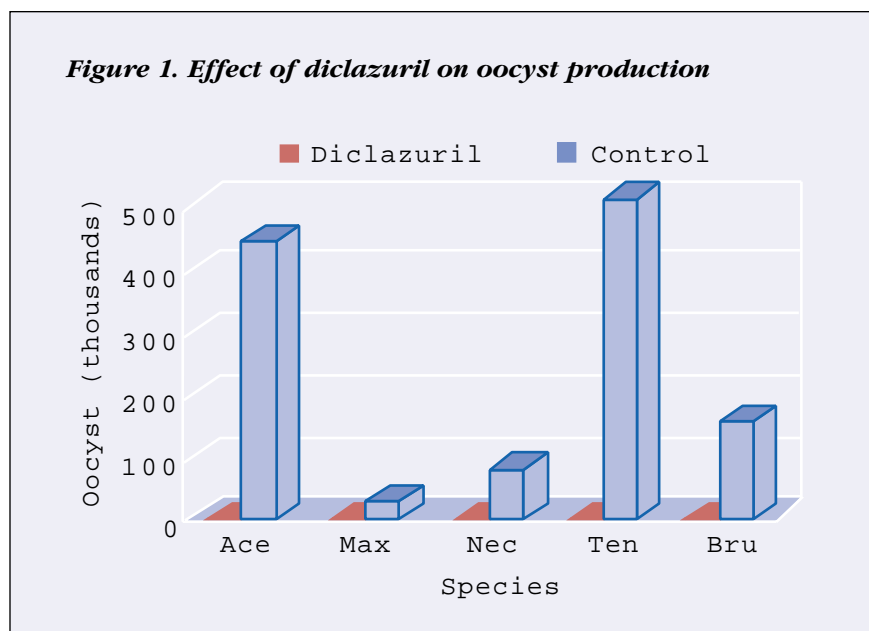


Figure 2. Efficacy of diclazuril against strains resistant to other drugs

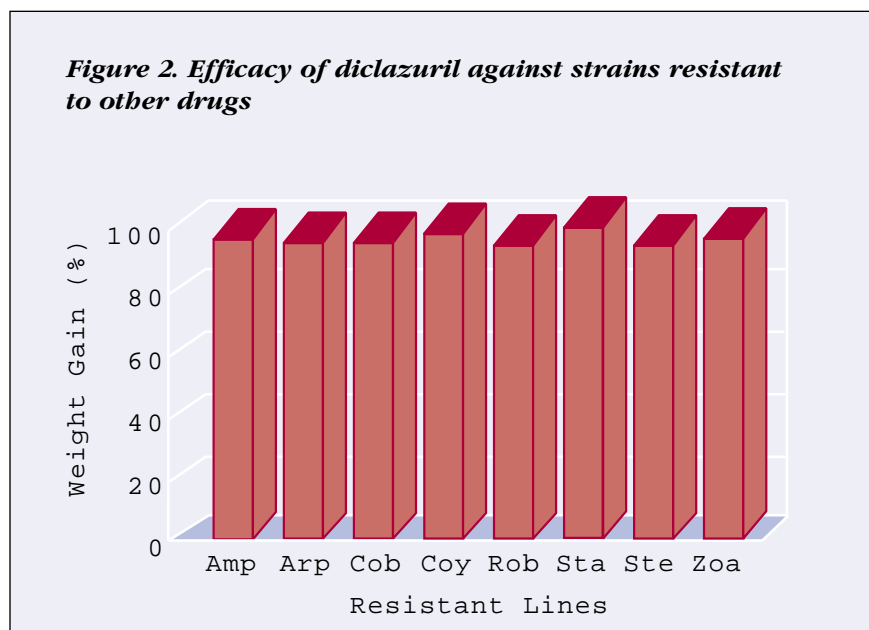


Figure 3. Resistance to drugs after 10 passages

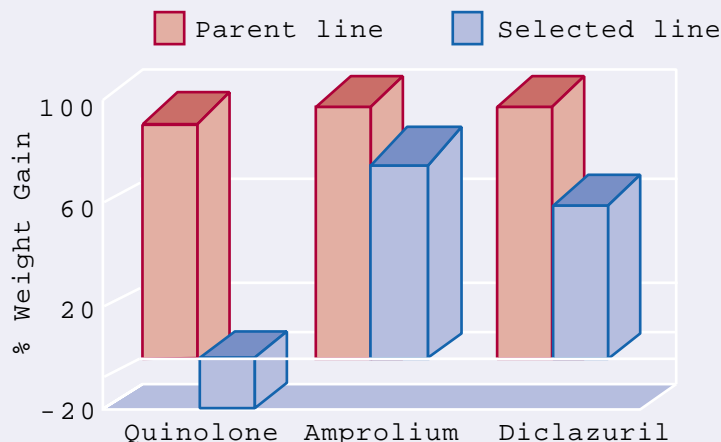
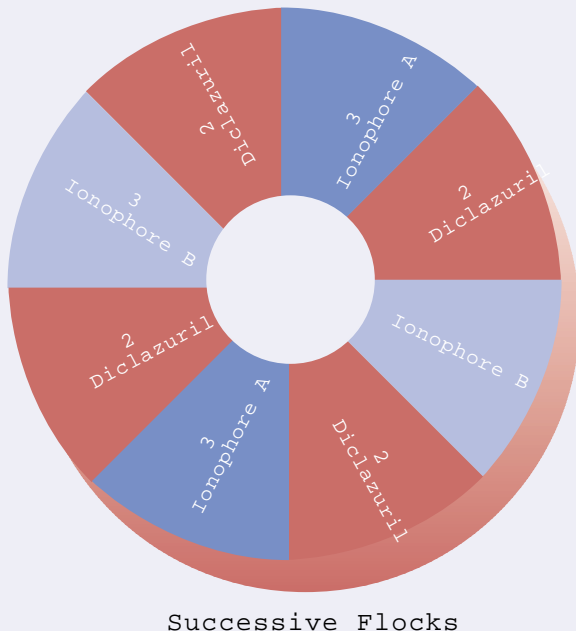


Figure 4. Diclazuril in rotation program with two ionophores



Alternating coccidiostats (rotation programs) has been practiced for many years, but the approach has been more empirical than systematic. For best results, diclazuril should be

used for no more than two successive flocks before rotating to an ionophore or a chemical/ionophore shuttle program; e.g., nicarbazin followed by salinomycin in starter and grower feeds (Fig. 4). Rotating diclazuril with a coccidiosis vaccine such as Coccivac-B (Schering-Plough Animal Health) will also help to “rest” feed additives and preserve their effectiveness.

Diclazuril: Where It Fits

Should diclazuril be used in the starter feed, the grower feed or in both?

It is important to include diclazuril in the starter ration to reduce the build-up of oocysts in the litter. Although lesions due to *Eimeria* are not often seen before 3 weeks of age, this is the period when the initial infection and multiplication of the parasite occurs.

Diclazuril can also be included in the grower ration because this is the period when the pathogenic effects of coccidiosis are most likely. Another reason to include diclazuril in both feeds is to eliminate any resistant strains — a goal that cannot be readily achieved in shuttle programs where a chemical is used only in the starter feed. This is because any oocysts of a “resistant” strain can survive in the litter for the brief period that a chemical is present in the starter feed. Published data suggest that when diclazuril is included in the grower feed, performance is similar to or better than other ionophore programs.

Rotation With a Vaccine

Coccidiosis vaccines have been employed for many years for the immunization of replacement pullets and broiler breeders. Over the past two years, however, the option for spray cabinet administration for one live vaccine, Coccivac-B, has caused usage in broilers to increase significantly. Published data have shown

performance of vaccinated birds to be statistically equivalent to conventional coccidiostats in flocks 35 days of age or older.

It should be noted that Coccivac-B contains strains of *Eimeria* that were isolated many years ago and are inherently sensitive to in-feed coccidiostats. The product can therefore be used to replace wild, resistant strains of coccidia with the vaccinal ones. It has been demonstrated that the use of Coccivac-B can restore the sensitivity to drugs in farms where extended usage of coccidiostats has selected for resistance.

For example, in a study of the efficacy of monensin against isolates of *Eimeria* obtained from broiler flocks after vaccination with Coccivac-B (Fig. 5), medicated birds showed improved weight gain and produced fewer parasite oocysts in their droppings. Alternating drugs and vaccines may therefore be advantageous since it could result in a restoration of sensitivity to anticoccidial drugs.

Getting More Creative

The growing interest in coccidiosis vaccination and the arrival of diclazuril present new options for managing the disease and reducing the potential for resistance.

For example, following use of an ionophore such as salinomycin, feed diclazuril for two cycles and follow with Coccivac-B for the next two cycles (Fig. 6). Diclazuril would “clean-up” the broiler house and subsequent use of the vaccine should then repopulate the house with drug-sensitive parasites. It should then be possible to return to salinomycin or other ionophore. An additional benefit of this approach is that use of the vaccine should prevent the emergence of resistance to diclazuril.

So far evidence to prove that rotation programs will improve the effica-

Figure 5. Restoration of drug efficacy, before and after Coccivac-B

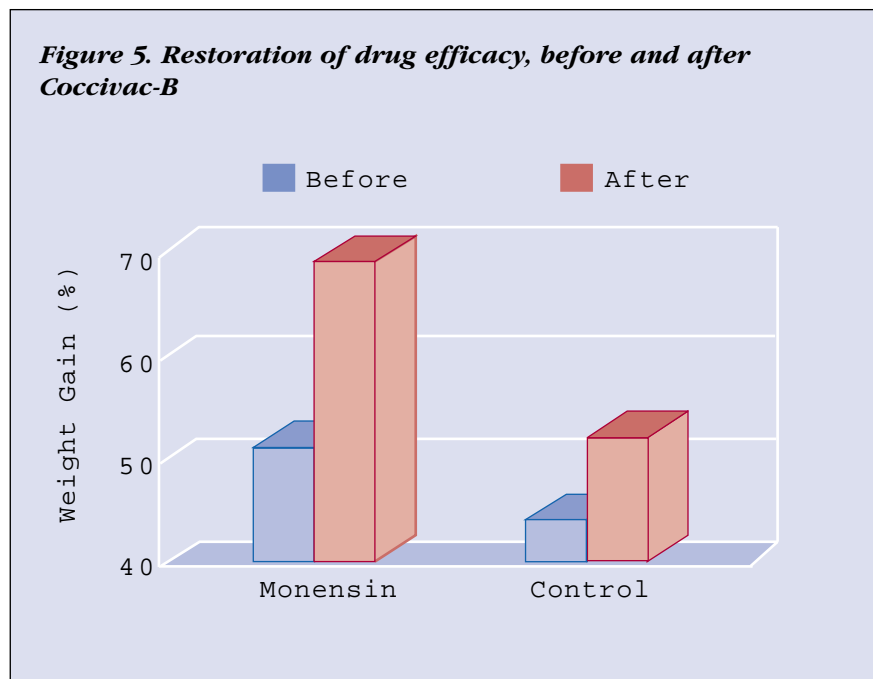
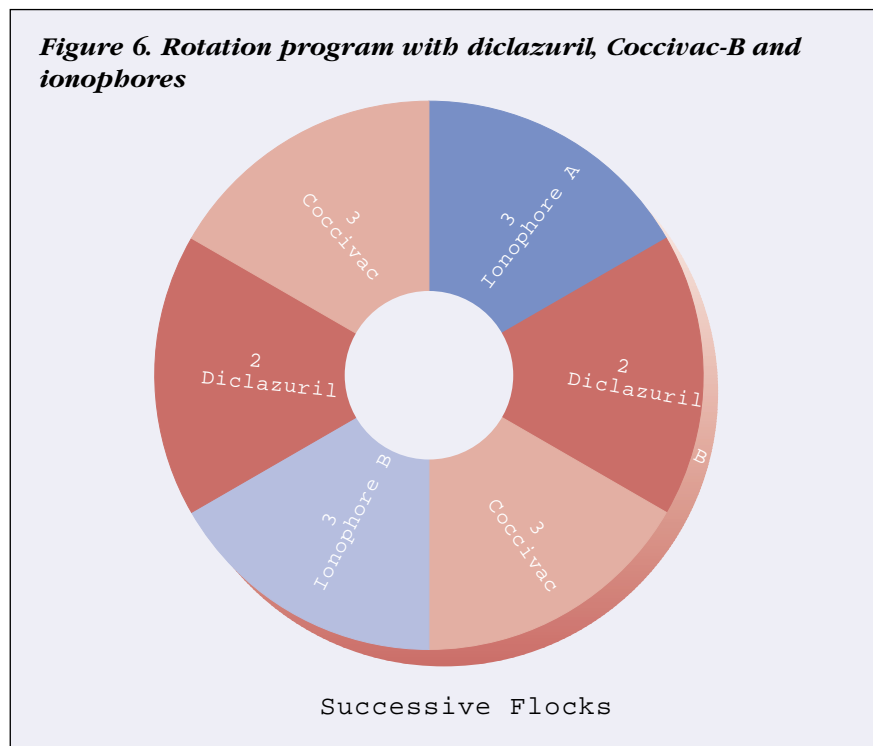


Figure 6. Rotation program with diclazuril, Coccivac-B and ionophores



cy of anticoccidial drugs in the longer term has not been obtained.

Nevertheless, adoption of novel strategies is important because few new effective drugs will be available in the future for the control of coccidiosis.

Customers Gather to Toast US Vaccine Plant Expansion, Anniversary

More than 150 producers, consultants, university specialists and other area officials affiliated with the Delmarva

poultry industry gathered in Millsboro, Del., recently to toast the 50th anniversary of Schering-Plough Animal Health's biologicals plant.

The company also took the occasion to honor Dr. Hiram Lasher, a local industry pioneer who started the plant in 1950 for his vaccine company company, Delaware Poultry Laboratories.

"We're proud of the plant's many contributions to the poultry industry over the last half century, and we're

very enthusiastic about the role it will play in the worldwide poultry industry in the 21st century," said Stephen Collins, vice president, worldwide poultry.

Schering-Plough Animal Health recently completed a \$4 million expansion and modernization of the facility to meet increasing demand for the company's poultry vaccines.

Expansion of the Millsboro facility has allowed Schering-Plough Animal Health to consolidate vaccine production for greater

efficiency. Poultry vaccines previously manufactured in the company's Nebraska plant will now be produced in Millsboro.

"Millsboro has become our center of expertise for producing these specialty products," Collins said.

"Next on the drawing board is a new facility in Millsboro for manufacturing our Coccivac line of coccidiosis vaccines, which has seen tremendous growth over the past year."



Dr. Hiram Lasher (third from right) with Schering-Plough's Marcelo Lang, Larry Manogue, David Kelly, Stephen Collins, Anthony Macci and Fred Searl.

Paracox-5 Approved in EU, Israel

Schering-Plough Animal Health has obtained marketing authorization from all 15 EU member countries and Israel to begin marketing Paracox™-5, a new attenuated vaccine that protects against the most economically significant species of *Eimeria* causing coccidiosis in broiler chickens.

Paracox-5 allows producers to protect broilers from coccidiosis, without using drugs or sacrificing performance.

Vaccination for coccidiosis and other major poultry diseases is expected to become more prevalent as poultry producers respond to growing consumer demand for meat products produced without in-feed medications.

Paracox-5 is a translucent, aqueous suspension for oral administration.

The vaccine, which is sprayed on feed given to day-old chicks to stimulate natural immunity, contains live, attenuated sporulated oocysts derived from *Eimeria acervulina*, *E. maxima* CP, *E. maxima* MFP, *E. mitis* HP and *E. tenella* HP.

Immunity begins to develop within 14 days of vaccination and is complete by 28 days after vaccination. Paracox-5 remains active for at least 42 days post vaccination and, in practice, may last longer if birds are allowed to access new oocysts present in the litter.

To help meet expected demand for the product, Schering-Plough Animal Health has invested US\$9.8 million to increase the production capacity of its two plants in the U.K.

All Fun and Spray



Poultry veterinarians from Brazil tossed their first snowballs after touring Schering-Plough's expanded vaccine plant in Delaware. Later in the week, after a surprise blizzard in North Carolina, they braved more than 2 feet of snow to visit a hatchery of a major integrator spray vaccinating with Coccivac-B.



FDA Clears Three Clinacox Combinations

Schering-Plough Animal Health has received combination clearances from FDA allowing U.S. broiler producers to feed Clinacox (diclazuril) with BMD (bacitracin methylene disalicylate), Flavomycin (bambermycins) or Stafac (virginiamycin), three leading growth enhancers.

Clinacox is a potent synthetic anticoccidial for broiler chicks that

has been used safely and effectively in Europe and other major poultry markets.

Because Clinacox is from a chemical family not previously used in the United States for coccidiosis, it is expected to be highly effective against ionophore-resistant *Eimeria* strains.

The product's active ingredient, diclazuril, has also received high

marks for safety. Birds treated with Clinacox have shown no signs of toxicity or other potentially harmful side effects.

Tolerance trials have also demonstrated that diclazuril has a wide margin of safety for other farm animals, so there is no risk if feed containing Clinacox is misfed to turkeys, breeders hens, swine or cattle.

To preserve the high efficacy of this versatile and safe anticoccidial, Schering-Plough Animal Health strongly recommends using Clinacox for no more than two consecutive grow-outs and then rotating to a coccidiosis vaccine such as Coccivac-B or another anticoccidial feed additive.



Spray Cabinet Approved for Coccivac-D

Coccivac®-D, a live oocyst coccidiosis vaccine used for many years in breeders and layers, has been approved by USDA for spray cabinet administration.

The spray cabinet — already used successfully in broiler operations to administer another coccidiosis vaccine, Coccivac-B — distributes the vaccine more uniformly than

other methods.

In broiler breeder and layer pullets reared on the ground, coccidiosis outbreaks can result in increased mortality, reduced weight gain and, subsequently, loss of flock uniformity.

Flocks affected by coccidiosis early in life may recover, but if an outbreak occurs late in the raising period (between 8 and 16 weeks of age), the

flock may lose uniformity, which may have an impact on egg production, fertility and hatchability.

With Coccivac-D, breeder flocks and layer pullets reared on floor are completely protected from all eight pathogenic species of coccidia that can affect the chickens.

The safety of Coccivac-D administered by spray cabinet

on the day of hatching was demonstrated in recent field studies conducted at poultry farms in Tennessee, Kentucky and Georgia.

No increases in mortality were reported, nor did producers involved with the trials observe side effects in vaccinated breeders and layers.

CP Bangkok *continued from page 9*

is changed for every flock. The diets of the drug-free birds have nutrient values comparable to the other birds in CP's system.

"But there are no anticoccidials or growth promoters," he adds. "We use acidifiers to control gram negative bacteria."

Denvanich says their goal is to pro-

duce all of their birds without anticoccidials or growth promoters, but he says this may take a few years.

"Eliminating antibiotics is not something you can do on every farm," he says. "It requires a higher level of management and modern buildings, with good ventilation and cooling systems."

COCCI FORUM

Editors: Joseph Feeks, Marcelo Lang
Design & Production: Deborah Sottile

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In the future, you will not depend on drugs to control coccidiosis.

If you want to start your future now, talk to us.

We are Schering-Plough Animal Health,
the makers of **Paracox™** and **Coccivac®**
brands of coccidiosis vaccines.



Schering-Plough
Animal Health

1095 Morris Ave.
P.O. Box 3182
Union, NJ 07083-1982 U.S.A.
Fax: 1-908-629-3206