

PANELISTS: MIKE BLAIR • TOM FROST •

•
MODERATOR: LEONARD FUSSELL
•

•
BILL JOHNSON • SHIVARAM RAO
•

Feeding Broilers for Optimum Health, Performance and Profitability

• ROBERT TEETER • PAUL TWINING JR. •

Proceedings of a roundtable discussion

held concurrently with the

2010 International Poultry Expo

Atlanta, Georgia

SPONSORED BY INTERVET/SCHERING-PLOUGH ANIMAL HEALTH



Feeding Broilers
for Optimum
Health,
Performance
and Profitability

Let's face it: Today's poultry producers have their work cut out for them.

As if rising costs for energy and feed weren't enough, they also have to find ways to add value to their products, meet the needs of today's health-conscious consumers and produce healthy, profitable birds with a dwindling arsenal of effective feed medications.

Knowing that feed accounts for about 70% of a modern poultry operation's costs,

nutritionists are looking for ways to further improve their return on their feed investment, but not just through traditional measures like feed conversion and growth rate. They're also exploring how nutrition can help stimulate immunity to coccidiosis and other gut diseases early in the bird's life to maximize intestinal health.

To help poultry companies meet this objective, we brought together top poultry nutritionists in the US for a roundtable discussion on their feed-management strategies.

These proceedings capture the highlights of this informative discussion. An audio version is

available on CD and online. For information, please contact your Intervet/Schering-Plough Animal Health representative or log on to the new Intestinal Health Center for Poultry at IHC-poultry.com.

We look forward to working with you to optimize the health and performance of your flocks.

Charlie Broussard, DVM, MAM
Director, US Poultry Technical Services
Intervet/Schering-Plough Animal Health
charles.broussard@sp.intervet.com



Editor's note: The content of this discussion was edited to make the information more concise and readable for a printed format.

To listen to the roundtable, see the CD affixed to the inside back cover or listen to the podcast at www.ihc-poultry.com/feeding-broilers

Roundtable participants

Panelists:

● MIKE BLAIR, PhD
Nutritionist
Pilgrim's Pride / Woodstock, GA

● TOM FROST, PhD, PAS
Director of Nutrition and Research
Wayne Farms / Oakwood, GA

● BILL JOHNSON
Senior Nutritionist
Tyson Foods / Magee, MS

● SHIVARAM RAO, PhD
Director of Nutrition and Feed Mills
Foster Farms / Livingston, CA


● ROBERT TEETER, PhD
Professor of Animal Science
Oklahoma State University / Stillwater, OK

● PAUL TWINING JR., PhD, PAS, Dipl ACAD
Independent Poultry Consultant
Princess Anne, MD

Moderator:

● LEONARD FUSSELL, DVM, MAM
Poultry Consultant
Cobb, Inc. / Millers Creek, NC





Feeding Broilers for Optimum Health, Performance and Profitability

- I. **Parameters of performance 6**
- II. **Key factors in broiler performance 7**
- III. **Identifying obstacles 8**
- IV. **Assessing coccidiosis-control programs 9**
- V. **Impact of coccidia leakage on intestinal health 11**
- VI. **Controlling subclinical coccidiosis 12**
- VII. **Alternative ingredients and gut health 13**
- VIII. **Traditional versus alternative coccidiosis control 14**
- IX. **Tools for improving immunity 15**
- X. **Dealing with feed restrictions 16**
- XI. **Will cost control remain the prevailing priority? 17**
- XII. **Lessons from antibiotic-free birds 18**

Parameters of performance

FUSSELL

With all of the challenges producers face these days, what are your operation's primary performance parameters for broilers? What metrics do you use to gauge your success?

FROST

We, too, look at adjusted feed ingredient costs. We feel that it represents both the nutritional side, the feed side and how the birds perform on that feed. We focus on that number and we adjust it specifically to bird weight class, depending on what size bird we're running in that operation.

BLAIR

Primarily what I concentrate on is our adjusted feed cost per pound of meat. That takes out the variation in buying and other factors. We also look at 7-day mortality and overall livability. If we have posting sessions, we're looking at coccidiosis lesion scores, etc. But the bottom line is profitability.

RAO

We track the past several years' performance. If the performance is not optimal, we know something's wrong. But we do also look at the feed cost per pound of meat.

TWINING

You also have to look at your individual program. You have to have a different program when breast meat costs \$1 per pound versus \$2 per pound. So your parameters will depend on that.



“Primarily what I concentrate on is our adjusted feed cost per pound of meat. That takes out the variation in buying and other factors.”

MIKE BLAIR

Key factors in broiler performance

FUSSELL

What factors or variables do you feel contribute most to live broiler performance?

RAO

It's actually the calorie and protein package — how we put it together — that influences broiler performance the most. But it is also very important to have the right coccidiosis-control program in place. That makes a big difference.

TEETER

The calorie and protein package as well as coccidiosis control are certainly extremely important. However, other aspects of the managerial environment have a calorific cost. Lighting programs today, for instance, are saving energy on the order of about 100 kcals per kilogram. Pellet quality is another managerial factor that will increase the effective caloric value of those rations.

TWINING

We also have to take into account bird genetics. That's been a major factor over the years in improving live bird performance. But raising birds profitably requires a total team effort.

JOHNSON

Another factor that's crucial is gut health. Without a healthy gut, we can formulate the best diet in the world and the birds still won't perform to our satisfaction. The same is true for our choice of drugs and feed additives. They all have a big impact on bird performance.

TWINING

As an industry, we saw the effects of subclinical coccidiosis when Clinacox hit the market several years ago and we gained 10 points of feed conversion overnight.

FUSSELL

It shocked all of us.

TWINING

Yes, it did. As an industry, we didn't recognize coccidiosis as the major disease that it is, as far as economics are concerned.



“Another factor that's crucial is gut health. Without a healthy gut, we can formulate the best diet in the world and the birds still won't perform to our satisfaction.”

BILL JOHNSON

Identifying obstacles

FUSSELL

What are the main obstacles hindering achievement of your performance goals? And what practical steps are you taking to get around those obstacles?

TWINING

One of our primary obstacles has been trying to ascertain the nutrient value for the ingredients coming into the feed mill. This has become a real interesting parameter with the varied corn and soy crop that we've had this year.

We've got some extreme variables in corn quality, depending on the geographic area of the country it comes from. We've seen considerable differences in mycotoxin levels in the corn. And there may be some fairly extreme differences in the caloric content of corn that's not showing up in our standard approximate analysis. Of course, we've got weather conditions we deal with all the time as well as housing conditions, and we have to make sure that the growers are on our program.

JOHNSON

I'd say that anticoccidials that just don't have the efficacy they did in years past is one of our biggest obstacles. We try to rotate frequently so we don't wear them out, but it's difficult because they're used a lot.

FROST

Our greatest challenge is ingredient quality. We continue to receive increased pressure to use more and more byproduct ingredients, yet the quality of those ingredients continues to go down. Poultry meal is a prime example. With more poultry meal being diverted to the pet food industry, the meal that we have left is far from the quality we used to get.

The same holds true for all of our meat and bone meal blends. It continues on to fat. The rendering situation — it's a challenge.

Distillers' dried grains (DDG) is another prime example. It's really hit the industry big as a prime ingredient, and yet we somehow have forgotten to look at the ingredients and the fat content. This, too, needs to be stabilized, and it's not.

BLAIR

One of the limiting factors in poultry nutrition today is the feed mill and how much bin space you have, especially with older mills. Another challenge is getting people to pay attention to how they're feeding the bird — good communication with your live service techs.

RAO

I agree. The feed ingredient quality is a major challenge for us. With the current lab techniques we use, results are coming back late. By the time we detect moisture or protein changes, the birds have already eaten that feed.

Another issue is a lack of flexibility in our feed mills, which prevents us from doing some of the things we would like to do. We can't bring in as much feed as we'd like or put it in a proper bin. Some bins are not properly designed, so feed gets hung up in the bins. In my company, we have premixes just to get around these kinds of problems. So it's a challenge.

Other significant challenges we're facing are looming restrictions on antibiotics in feed.

Assessing coccidiosis-control programs

FUSSELL

How do you gauge the performance of coccidiosis-control programs at the companies you consult with?

TWINING

One of the primary things we do is get veterinarians to conduct posting sessions. I also get out to do my own posting sessions in the field. I'm not trying to take over the veterinarian's responsibilities, but I like to see what things look like in the field.

JOHNSON

We look at feed conversion or calorie conversion in our birds, particularly when we have multiple complexes where we can compare side-by-side complexes that are on identical programs. We know there are geographic differences, probably, between those complexes — that one may have more of a coccidiosis problem than another.

Regarding posting sessions, every one of us could say that we have reams of posting session results that said we didn't have problems; then Clinacox came along, and we got a whole lot better. So maybe we did have problems. We just didn't diagnose them properly.

TWINING

Here's how I think we messed up on our posting sessions: We were looking at gross lesions instead of microscopic lesions. If you look at microscopic lesions, particularly on *E. maxima*, that will track pretty closely to some of your poultry health problems. That's probably one of the things we failed on in evaluating those sessions.

FROST

I have the same concerns about posting sessions that have been voiced here already, and rarely do you see one that exhibits a problem. We'll occasionally see one when a micro lesion shows up.

But having a single veterinarian to cover all that — it's a lot to do. But I've always felt that our field reps are the ears and eyes of what goes on out there. I know we all have degrees behind our names, but those guys who are in those pickup trucks know what coccidiosis looks like when they see it.



“I know we all have degrees behind our names, but those guys who are in those pickup trucks know what coccidiosis looks like when they see it.”

TOM FROST

IV

Assessing coccidiosis-control programs

Feeding Broilers
for Optimum
Health,
Performance
and Profitability

BLAIR

I agree. We use the field personnel as point persons for feedback. It's most sensitive in the small-bird operation, where we're changing kill size almost weekly at times, and they're going to a smaller bird. Then the concern becomes that you're going to get off the grower feed too quickly, depending on the program, especially if 3-Nitro is in there, hit the withdrawal time, and then the next thing you know, they're breaking with coccidiosis at 27, 28, 29 days and even in some larger-bird programs.

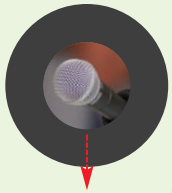
I go back to the feeding schedule and how important it is to feed correctly. We've found, working with the vet and the field techs, that we were going off the grower feed too early because they wanted to use cheaper feed or for some other reason, and then they would end up having coccidiosis breaks.

RAO

At Foster Farms, it's most important to us to get to the target weight on a given day. So we look for that closely in feed conversion. When we go to a new anticoccidial or coccidiosis-control program, we get out to the field and look at the droppings. Are there any changes? We also take weekly bodyweight measurements at some key farms.

TEETER

We've found that even very low coccidiosis lesion scores have a significant impact on the broiler. Typically, they'll back off on feed intake. To some degree, heat production will actually increase, so the bird's maintenance energy requirement goes up, leaving less energy available for protein and lipid accretion. Along with this, malabsorption increases. And this is occurring even with low-level lesion scores.



“We've found that even very low coccidiosis lesion scores have a significant impact on the broiler.”

ROBERT TEETER



Impact of coccidia leakage on intestinal health

FUSSELL

To what extent do you think coccidia leakage hurts intestinal health? And how does it impact weight gain and overall broiler efficiency? Do you think it predisposes birds to other costly infections, such as gangrenous dermatitis, for example?

FROST

Coccidia leakage is interesting because, on the one hand, you need it. A lot of us use that as a way to develop immunity and enhance the coccidiosis-control program.

But depending when that leakage occurs and to what degree it occurs, it can really negatively impact bird performance. So long as you can keep it at a controllable level up front, early in the bird's life cycle, then it's something that you have to have. It's late leakage that really hurts us in feed conversion and nutrient absorption.

BLAIR

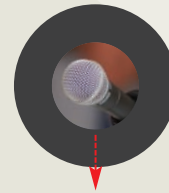
Once you get leakage and trigger the immune system, you're taking nutrients away from growth — calories, protein, what have you. So there's no doubt that leakage does hurt the bird; it's just to what level? And again, when does it occur? Early on or later in life? The later it is, the worse it is.

TEETER

There's a tremendous impact, depending upon when the leakage occurs.

As an example, in birds less than 800 grams, a mild coccidiosis challenge can result in malabsorption for the consumed energy in those birds, amounting to between 20 kcals and 40 kcals of energy per day.

When we go up to birds ranging in size between 2.5 kg to 3 kg, malabsorption can increase up to 80 kcals to 90 kcals of energy per day.



“Once you get leakage and trigger the immune system, you're taking nutrients away from growth.”

MIKE BLAIR

Controlling subclinical coccidiosis

FUSSELL

As alluded to earlier, around the turn of the century, when US producers started using the new synthetic anticoccidial diclazuril, or Clinacox, many of us saw a five-point or better gain in feed conversion. Unfortunately, that didn't last, because the product was overused and coccidia developed resistance.

What that experience showed us, however, is that there was a lot of performance being lost, even to subclinical coccidiosis.

What can we do today to help control subclinical coccidiosis and reclaim some of those performance gains?

BLAIR

The first thing is to identify a subclinical coccidiosis problem, and if there is one, where is it happening? Is it early during production? Is it happening late in production? Why is it happening? And look at the history of your anticoccidial use.

I'm working with 27 complexes, so we have to identify it complex by complex and not make blanket recommendations, which sometimes we tend to do because it's easier.

TEETER

The earlier that we can get birds to develop immunity against coccidiosis, the better performance is going to be.

The calorific costs of immunity development without the influence of coccidiosis is less than 30 kcals of energy. So we're talking a very low energy cost and nutrient input to actually develop immunity.

Where the costs are coming from with a low-level incidence of lesion scores is in the birds' immune response or from the consequences of coccidiosis itself and in the malabsorption. Developing immunity early will help prevent those more massive costs later.

TWINING

The size of the bird we're producing has a lot of influence on how we deal with the coccidiosis challenge. We can develop immunity on a big bird early, and that may cost us some up-front performance, but the bird will gain that back. This may not always be the case in smaller birds. So we've got to tailor this to our bird program.

JOHNSON

I agree. It's been common practice in years past that you wouldn't feed an anticoccidial much past 30 days of age. And I know our company now is using anticoccidials in the withdrawal feed right up to slaughter, because we don't have the time for compensatory gain. We need to control it as best we can right up to the day that they go to the plant.

FROST

My concern is the number of tools that we have to deal with coccidiosis. The drugs that we have continue to get used up, and it becomes very difficult to balance and keep the drugs successful. I feel like we have to learn how to be successful with coccidiosis vaccination because the coccidiosis challenge is not going away. We've got to be judicious in how we manage these medications and properly use the vaccines that control coccidiosis. I don't see a silver bullet.



Alternative ingredients and gut health

FUSSELL

What sorts of issues need to be considered when using alternative, lower-cost ingredients in your feeds, and how do they affect gut health?

RAO

Working through those issues involves a lot of homework. We've got to make sure that when we bring in alternative ingredients, we know the consistency and digestibility of the product. We need to know we are not altering the amino acid balance or calorie and protein balance. So the more homework we do, the better it will help us with gut health.

TWINING

With alternative ingredients such as DDG, you've got to have information going clear back to the production plant. Because there can be a tremendous difference between DDG from plant A versus plant B, or company A versus company B. I know that personally, I will not buy DDG on the open market, through a broker. I want to know exactly the plant of origin. It's the same with bakery meal.

I have not fed glycerol, but some of the research would show tremendous variability in that product — everything from methanol content to purity. So it gets back to knowing what you're dealing with.

JOHNSON

I agree. And one of the disadvantages to this new DDG market is that it's very immature and doesn't yet have well-established trading rules. Many of these DDG are traded through brokers and resellers as opposed to getting it directly from the producers.

FROST

It also gets back to laboratory analyses and how well our tests perform. Even our longstanding test for peroxide is not a very good test. It's difficult to track degradation. But those are challenges that we've got to overcome in some way.



“We've got to make sure that when we bring in alternative ingredients, we know the consistency and digestibility of the product.”

SHIVARAM RAO

Traditional versus alternative coccidiosis control

FUSSELL

What's been your experience with maintaining gut health using traditional control methods – anticoccidials and growth promoters, for example, as compared with alternative methods such as vaccination, competitive exclusion, organic acids and herbs?

TEETER

In our research experience, we've had the opportunity to contrast some of the ionophores with vaccination programs.

In those experiments, we've found better control with the vaccination program throughout the life span of the bird. Whether the ionophore programs are dropped during withdrawal or they are left in through the end of the study (to avoid some late curve challenges), the response isn't as consistent as it is with a vaccination program.

TWINING

Once we start dropping the anticoccidials and low-level antibiotics, then management becomes even more critical because we're taking some of the crutches away from our production system. Bird management, density and poultry house management all become more critical. You will see more of the alternative products such as probiotics, prebiotics and essential oils being promoted for that type of production.

JOHNSON

We're new to alternative methods, including vaccination. We've had some successes and some that have not worked as well as we had hoped. We're still trying to learn what mitigating factors are involved that cause some of these products to not work as well as we'd like them to. It may be that managing the environment has a big impact on how some of these alternative products will work or not work.

FROST

Our company has a pretty good history of what we feel is a balanced approach toward coccidiosis control; we move back and forth between a vaccination program and an anticoccidial program. We feel that in the future, we're going to have to know how to control coccidiosis with methods other than the standard anticoccidial methods.

I certainly hope that companies manufacturing coccidiosis vaccines recognize the fact that there will need to be changes over time. We need to stay on top of the situation, continue with research and make sure that we're doing the best we can.

IX

Tools for improving immunity

FUSSELL

Consumer demand for poultry “raised without antibiotics” continues to rise. But we also know that ionophores and other medications play major roles in controlling diseases.

Can improved immunity through better nutrition increase the demand for birds raised with no antibiotics? What other tools can be used to manage intestinal health?

TWINING

We know that stimulating the bird’s immune system challenges nutrient requirements, so we have to take care not to hyper-stimulate the immune system. Some of the prebiotic compounds may be detrimental to the bird instead of improving the bird’s performance. It’s a very fine line we’re walking here.

JOHNSON

With regard to a demand for birds raised with no antibiotics, we tried “no-antibiotic” marketing but stopped because of some complications and also a lack of demand. It just didn’t catch on, at least for us.

As far as natural-type products that we can add to the feed, we’re playing with a few — some with good success and others with not such good success. But we’re going to keep looking at them because those may be products we have to use and make work in our program if we’re to survive into the future.

RAO

Although the antibiotic-free market is not there right now, it’s going to happen. In a year or two, it’s going to come. I’m concerned that we be prepared for that — that we be a source of antibiotic-free poultry.

I’m kind of excited about vaccines. They’re something we need to keep improving on and maybe they will give us some answers.

TEETER

We’ve done such a good job in the agricultural community at producing food at a low price that the consumers today, to some degree, are purchasing a concept in their food. They perceive a health or nutrition benefit coming from it that’s perhaps aside from what we’re attempting to produce in agriculture.



“Although the antibiotic-free market is not there right now, it’s going to happen. In a year or two, it’s going to come.”

SHIVARAM RAO

The cost of disease is much higher than the cost of developing immunity. The cost of developing a specific immunity is low, so in terms of a future for something such as antibiotic-free poultry, I think it will be a concept at some point. And people will demand this type of product.

X

Dealing with feed restrictions

FUSSELL

What sorts of restrictions do you have in your feed manufacturing operation in terms of in-feed antibiotics, dewormers, growth promoters and anticoccidials? I'm speaking here of capacity issues, technical restrictions and so on.

TWINING

We find in some of our older mills that keeping a drug like nicarbazin out of the breeder feed is a real problem. In some cases, we just will not use it because of the potential for cross-contamination into our breeder feeds. These kinds of issues eliminate some of the tools available to us.

FROST

Dewormers are a real challenge. We don't have any, really, to speak of in the feed anymore. That's really a feed mill problem. Category 2 drugs require withdrawal time and some feed mills struggle with being able to handle those kinds of medications. It requires close attention to flushing the bin — keeping it out of breeder feeds.

JOHNSON

From a mechanical standpoint, we don't have the microbins available that would enable us to use several of these feed additives that might give us some help. We never dreamed that we would be using so many different ingredients.

BLAIR

We have several mills that, due to their design, have to be very cautious to avoid cross-contamination. If it's not done correctly, it can be very costly. So all that has to be considered, all the way down to trucking and the delivery of ingredients. It requires close attention to details.

When you start rotating drugs and running shuttle programs, and then you've got enzymes and natural growth enhancers and other products, it creates a tough decision-making situation. There are just so many different products available. We have to make hard choices about which ones give the best return.



“When you start rotating drugs and running shuttle programs, and then you've got enzymes and natural growth enhancers and other products, it creates a tough decision-making situation.”

BILL JOHNSON



Will cost control remain the prevailing priority?

FUSSELL

You all well know that feed accounts for 65% to 70% of the costs of broiler production. And so major US poultry companies have traditionally focused on developing least-cost rations to ensure profitability.

Is that still the prevailing strategy?

RAO

We say we are doing everything for least cost, but all of us are also spending time on bird quality issues. We think about throughput in the feed mill — the pellet quality. We think about enzymes. So it's no longer just cost.

JOHNSON

I've seen a big change in our company in the last year. We used to be more segmented; we would do the least-cost production on the live side, then deliver that bird to the plant and it was their job to do the best they could with that bird.

Now what we've done is go back and say, "Hey, if we increase our live costs by a quarter of a cent, it's going to give us a penny a pound advantage at the plant." So that makes sense.

We may not be the least-cost producer in Agristats, but we may be one of the more profitable.



“Now what we’ve done is go back and say, ‘Hey, if we increase our live costs by a quarter of a cent, it’s going to give us a penny a pound advantage at the plant.’”

BILL JOHNSON

Lessons from antibiotic-free birds

FUSSELL

Have you learned anything about feeding antibiotic-free birds that you've applied to the conventional birds you produce?

TWINING

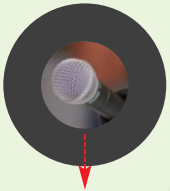
Well, we've learned that if we have better husbandry, we have fewer problems. We've seen lower bird density in the antibiotic-free programs, and we're using some fairly high levels of probiotics in place of an antibiotic. All of these things are expensive in a large-scale production system, so it comes back to a specialty-type program where we have to have a premium to make it economical.

RAO

Our specialty program is antibiotic-free/organic. In the past year, our conventional program has adopted some things from that program. Mainly, it's the fat quality. In our antibiotic-free/organic program, we use high-quality soybean oil, and the performance is better than in our conventional program. So now we have our own fat-blending facility. We have dramatically improved our fat quality.

Another thing we've learned is the importance of providing more space. Based on the results in our antibiotic-free/organic program, we were able to convince management to give us more space for the conventional birds.

Those changes came directly out of experience with our antibiotic-free/organic program.



“In our antibiotic-free/organic program, we use high-quality soybean oil, and the performance is better than in our conventional program.”

SHIVARAM RAO



The CD affixed to this page contains an audio recording of the roundtable discussion.

For additional copies of the CD, contact your Intervet/Schering-Plough Animal Health poultry representative. You can also listen to a podcast of the roundtable at www.ihc-poultry.com/feeding-broilers.

OUTLINE IS FOR POSITION ONLY OF CD



ABOUT
INTERVET/SCHERING-PLOUGH
ANIMAL HEALTH

Intervet/Schering-Plough Animal Health, based in Boxmeer, the Netherlands, is focused on the research, development, manufacturing and marketing of animal health products. The company offers customers one of the broadest, most innovative animal health portfolios, spanning products to support performance and to prevent, treat and control disease in all major farm and companion animal species. In poultry, Intervet/Schering-Plough Animal Health is the world's largest developer and marketer of vaccines for poultry.

Intervet/Schering-Plough Animal Health is a subsidiary of Merck & Co., Inc., Whitehouse Station, NJ, USA. For more information, go to www.intervet.com.

ABOUT MERCK

Merck and Schering-Plough recently merged to create a stronger, more diverse and more truly global company. This not only benefits the company and its shareholders, but it also benefits the millions of people around the world who rely on the company's products and expect it to continue to deliver exceptional value. Today's Merck is working to help the world be well. Through its medicines, vaccines, biologic therapies, and consumer and animal products, the company works with customers and operates in more than 140 countries to deliver innovative health solutions. Merck also demonstrates its commitment to increasing access to healthcare through far-reaching programs that donate and deliver products to the people who need them. For more information, visit www.merck.com.

www.ihc-poultry.com

Copyright © 2010 Intervet International B.V.
All rights reserved. ISP-PBU-584.