New strategies in coccidiosis control to meet customer demands

In 2014-2015, the US broiler industry saw press releases from some of their top retail customers announcing that they would serve only chicken produced without antibiotics.

by Linnea Newman, Global Poultry Technical Service Director, MSD Animal Health. www.merck.com

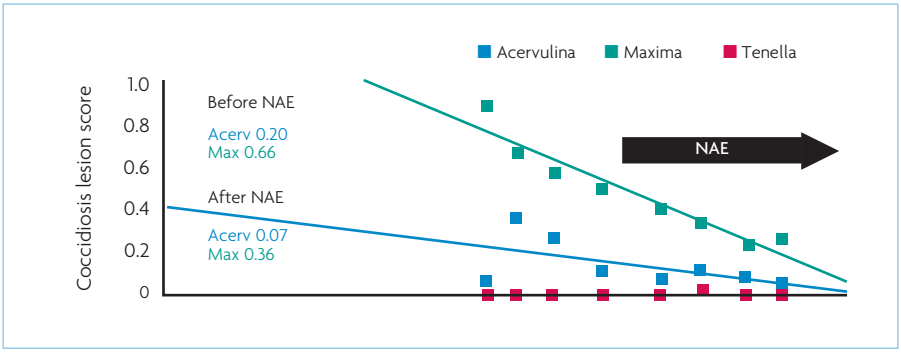


Fig. 1. Coccidiosis lesion score.

The announcements represented different positions: Restaurant Chain A (the largest US chicken restaurant chain based on revenue) stated in February of 2014 that by 2019 their product would contain 'No Antibiotics Ever' (NAE), while Restaurant Chain B (one of the largest fast-food retailers in the world) quickly followed with an announcement that by 2017, they would serve only poultry raised without medically important antibiotics (RWMIA) and Restaurant Chain C, producing sandwiches worldwide, initially announced in early October of 2015 that they would serve only RWMIA poultry, only to quickly change that position on October 20, 2015 to the use of only NAE poultry by March of 2016.

What does this mean to coccidiosis control? The RWMIA designation allows for the use of ionophores. Although they are technically antibiotics based upon the strict definition of 'antibiotic', ionophores are not a shared class with any antibiotic used to treat humans.

RWMIA flocks may also use chemical anticoccidials and coccidiosis vaccines, but they may not use antibiotics that are shared-class with humans, such as bacitracin, virginiamycin, enramycin, tetracyclines, penicillins, gentamicin, cephalosporin, sulfas, etc.

The NAE designation does not allow the use of ionophores. Courts in the US had previously ruled that companies could not make a 'raised without antibiotics' label claim and still use ionophores because it was misleading to the consumer.

The NAE label still allows for the use of chemical anticoccidials and coccidiosis vaccines, but not ionophores, and, of course, none of the antibiotics that are shared class with humans.

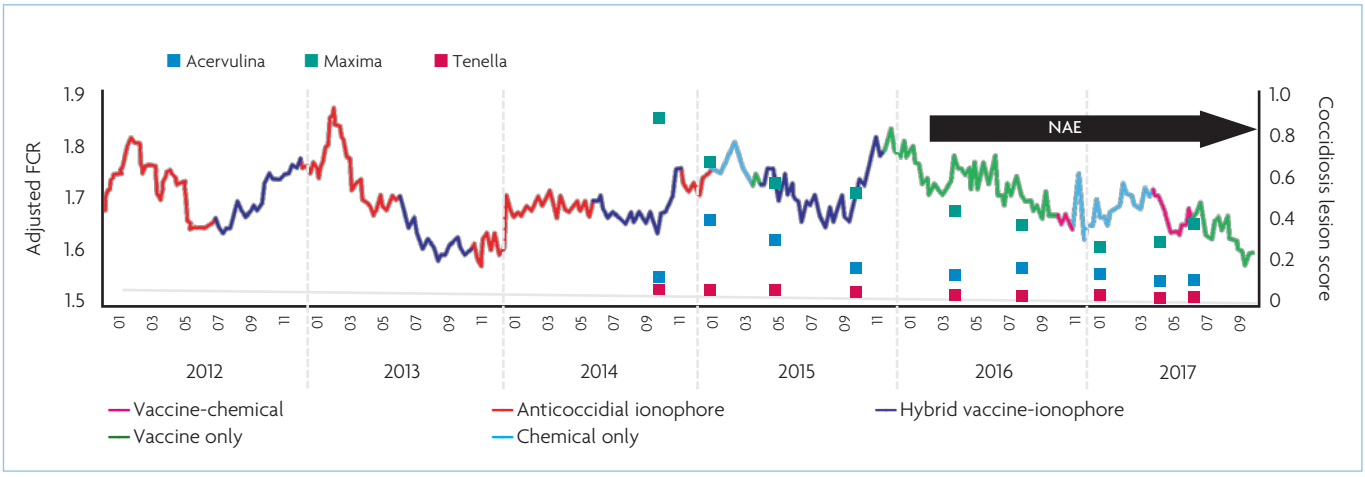
Rising to the challenge

Most US broiler producers have risen to the retail customer's challenge, changing all or part of their production to accommodate the RWMIA or NAE labels.

RWMIA strategies include regular chemical-ionophore shuttle programs or straight ionophore programs that have long

Continued on page 17

Fig. 2. Adjusted FCR (1.8kg broiler) vs. coccidiosis lesion score and coccidiosis control program. Field data from a US 1.8kg broiler complex representing 1.3 million broilers slaughtered per week.



Continued from page 15
been used by the industry, but they have also given rise to new 'hybrid' strategies that utilise both a coccidiosis vaccine and an ionophore. NAE strategies include all-chemical anticoccidial programs, coccidiosis vaccination programs and even hybrid coccidiosis vaccine-chemical strategies. Coccidiosis vaccines were used in 40% of all US broilers placed in 2017, either in hybrid programs or as stand-alone vaccination programs.

Hybrid programs

A hybrid program uses a coccidiosis vaccine as an anticoccidial-sensitive seed stock, not as a 'vaccination'. Day-old broiler chickens are given live, sensitive oocysts at the hatchery (the coccidiosis vaccine). These oocysts are allowed to complete at least two life cycles in the flock, shedding sensitive oocysts into the litter until about 14 days of age.

After that, an ionophore (RWMIA) or a chemical (NAE) is included in the feed to complete the growth cycle of the poultry flock like a regular anticoccidial program. The goal is to seed the house with sensitive oocysts to out-compete with the wild, less sensitive, cocci and to allow the anticoccidials to perform better. Integrators using this program claim 50 to 100g improvement in feed conversion ratio (FCR), and have called this a 'performance program'.

When an ionophore is used in this way, it is also in a position to help prevent dysbacteriosis or necrotic enteritis without using any medically important antibiotics. These programs do not renew sensitivity for subsequent flocks, but they may reduce late oocyst shedding and reduce the overall Eimeria spp. load on the farm.

Integrators using all-chemical anti-coccidial programs have had variable success. Chemical anticoccidials prevent coccidiosis, but they have no antibiotic effect. Peaks in subclinical Eimeria spp activity can correspond to outbreaks of necrotic enteritis, dysbacteriosis or poor FCR performance. This is especially true if the peak in subclinical coccidiosis occurs at the same time as a feed change.

Chemical anticoccidials must be monitored and rotated as needed to maintain low coccidiosis levels, particularly at critical stress periods.

Companies using these programs have had significant success in the control of their coccidiosis challenge. When necessary, vaccination programs can be interspersed to maintain sensitive field populations. All-chemical programs are consistent with the US NAE designation.

Integrators using true coccidiosis vaccination programs are also consistent with the US NAE designation. Some integrators use vaccination on a year-round basis.

Others augment vaccination programs with a cycle or two of a vaccine-chemical hybrid program or all-chemical programs during the high humidity winter months.

The use of at least three to four flock cycles of coccidiosis vaccination (not hybrid) serves to maintain a more sensitive Eimeria population on the farm.

In addition to these strategies, US integrators have been working to increase the down time between flocks, aiming for a 16-day average.

Each of the strategies, used correctly, can serve to reduce overall coccidiosis challenge on the farm. Matching coccidiosis lesion scores (as determined by regular post-mortem sessions) and comparing to FCR performance demonstrates the impact of improved coccidiosis control strategy on profitability and performance. When the cost of an additional seven days' down time is calculated vs. the return in FCR at today's feed prices, the result is a 50% return on the input cost, largely due to the reduction in coccidiosis challenge.

It should be noted that the coccidiosis lesion scores are not clinical. Lesion scores studied in the industry average less than a +1 in the traditional scoring systems based upon a score of 1-4. But average microscopic E. maxima scores greater 0.6 correlated to 50-100g more feed per kg of weight compared to lesion scores of less than 0.4. Small reductions correspond to significant improvements in performance.

Some integrators are using a vaccine-ionophore program to initiate the reduction in Eimeria spp challenge prior to implementing an NAE program.

Once the overall challenge level is reduced, it is easy to be flexible, using hybrid ionophore or vaccine alone to adjust to sales demands for RWMIA or NAE.

The reduction of overall Eimeria spp. challenge also means that dysbacteriosis and necrotic enteritis are significantly reduced, even on the NAE program.

Conclusion

New coccidiosis control strategies to reduce coccidiosis challenge on the farm compared to the traditional chemical-ionophore shuttle or full ionophore program are helping the US broiler integrators to successfully accommodate their customer's requirements while remaining profitable.

It is still easier to produce cost-effective broiler meat in an RWMIA system that allows the use of ionophores, but the NAE producers are demonstrating significant success as well. ■