STRIKING A BALANCE

Antibiotic-free poultry production is growing fast, but how far can and should it go?

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PART 1:
STRIKING A BALANCE WITH ABF PRODUCTION
Back in 2013, less than 5% of the chicken produced in the US was raised without antibiotics. That number nearly tripled in 2015 and could reach 25% to 30% within 5 years. How is the poultry industry adjusting? And how far can and should antibiotic-free (ABF) production go? In this in-depth report, Poultry Health Today looks at what is arguably the most controversial issue in the industry.

PART 2:
FAST GROWTH SEEN IN ABF PRODUCTION, BUT FOR HOW LONG?
To see how ABF production is trending, Poultry Health Today asked market-research specialist Greg Rennier, PhD, to crunch some numbers on the four antibiotic approaches used by today’s producers — Full Spectrum, Reduced Use, Ionophores Only and No Antibiotics Ever.
“When carcasses are rejected at processing, all the time and money that went into production is lost,” Lloyd Keck, DVM, says. “Couple that with even slight increases in the condemnation rate, and the losses really mount.”

William Flynn, deputy director of FDA’s CVM, sat down with Poultry Health Today editors for 90 minutes to clear the haze of the new VFD rules.

It’s fine to produce and promote poultry raised with “no antibiotics ever.” But for everyone’s sake, let’s not do it in a way that suggests there’s something wrong or even harmful about conventionally raised poultry — a group that makes up at least 80% of our market, Tim Cummings, DVM, says.

Most US poultry companies are doing an “outstanding job” controlling Salmonella — not only in processing but in live production, according to Charles Hofacre, DVM, PhD, University of Georgia. Still, there’s always room for improvement.

After reviewing data demonstrating that lasalocid is rapidly depleted from tissues, Japan and the EU raised the maximum residue limits permitted for this powerful (and much needed) ionophore.
The carbon footprint index for chicken, compared to 16.2 for beef, 12.0 for lamb and 9.0 for pork.

2020: THE CHICKEN CAN FEED THE WORLD, PEEL HOLROYD

If we don’t respect the feelings of consumers and other stakeholders, they’re not going to respect us. What we’re finding is we can’t speak to them as if we’re arguing policy issues. Even if their feelings aren’t rational, they’re still valid as feelings.

JOE FORSTHOFFER, DIRECTOR OF CORPORATE COMMUNICATIONS, PERDUE FARMS

One often-cited statistic comes from the Union of Concerned Scientists, which claims that 70% of antibiotics produced in the US are fed to livestock — a statistic they cannot possibly calculate, considering that antibiotic use in humans is not tracked.

83.6

Pounds per capita of chicken consumed by Americans and more than anyone else in the world.

BROILER CHICKEN INDUSTRY KEY FACTS, THE NATIONAL CHICKEN COUNCIL

Percent of Americans who feel the agriculture industry is transparent on production practices — up from 22% in 2012.

FOODTHINK, EMERGING FAITH IN FOOD PRODUCTION, MARCH 2014

When was the last time the world’s poultry industry got a new anticoccidial — 15 or 20 years ago? We still have good tools available, but we need to do whatever we can to preserve their effectiveness and optimize their performance. Planning ahead and thinking about your program 12, 18 and even 24 months from now is a huge step in the right direction.”

GREG MATHIS, PHD, SOUTHERN POULTRY RESEARCH
The cause of the 2014-2015 outbreak was linked to a highly pathogenic H5N8 influenza A virus that spread from Asia to North America by migratory waterfowl.

Research: Highly pathogenic AI does not persist in wild birds

While the H5 avian influenza A virus that devastated some Midwestern poultry farms in 2014 to 2015 was initially spread by migratory waterfowl, evidence now suggests that highly pathogenic flu viruses do not persist in wild birds.

Investigators analyzed throat swabs and other biological samples obtained from more than 22,800 wild ducks and other aquatic birds collected before, during and after the outbreak. Sampling was conducted in Canada, the Mississippi flyway and along the US Atlantic coast, reports St. Jude Children’s Research Hospital, which led the research.1

None of the migratory birds included in this analysis were infected with highly pathogenic avian influenza, according to the study, published in the Proceedings of the National Academy of Sciences.2

Early SE infection likely to stay with broilers until market age

Broilers with lung exposure to Salmonella Enteritidis (SE) on the day of hatch are very likely to be positive for the pathogen at market age, investigators from Auburn University said at the 2016 Western Poultry Disease Conference.3

For a study they conducted with commercial broiler chicks, the investigators challenged the birds on day of hatch with SE administered intratracheally or subcutaneously. The birds were then raised with standard husbandry and biosecurity practices and received a standard diet with an ionophore.

On days 35 to 38, the investigators sampled multiple sites using 102 birds in the intratracheal group and 80 from the subcutaneous group. Significantly fewer \( (p < 0.05) \) positive samples were obtained from the subcutaneous compared to the intratracheal group. Overall, 82% of the intratracheal and 39% in the subcutaneous continued
Although stocking density can influence hens’ SE susceptibility, other housing system parameters might contribute to the outcome of infections, the investigators concluded.

In two trials, the researchers placed groups of laying hens at two different stocking densities into colony cages. One group consisted of 40 hens housed 20 per cage at a stocking density of 973 cm² (1.04733 sq. ft.) floor space per bird, and the other group consisted of 60 hens housed 30 per cage at a stocking density of 648 cm² (0.697501 sq. ft.) floor space per bird. The investigators orally inoculated the birds with SE and then cultured internal organs 5 to 6 days later.

Significantly more SE ($p < 0.05$) was recovered from livers (75% versus 51.4%) and ovaries (51.4% versus 30.6%) of hens from the higher-density group, according to investigators from USDA’s Agricultural Research Service and North Carolina State and Michigan State universities. However, they also found that spleens from hens in the higher-density colony cages were significantly ($p = 0.0018$) less often positive for SE compared to hens challenged with SE but housed at the same density — 90.3% versus 68.1%.

Although stocking density can influence hens’ SE susceptibility, other housing system parameters might contribute to the outcome of infections, the investigators concluded.

**STOCKING DENSITY CAN INFLUENCE SE SUSCEPTIBILITY IN LAYING HENS**

Higher stocking density can render layer hens more susceptible to *Salmonella Enteritidis* (SE), according to a report in *Poultry Science.*

If SE is introduced into the lungs via the trachea on day of hatch, there is a high chance the majority will have SE when processed, the investigators concluded. If birds are scratched on day of hatch and SE is introduced into the wound, there is a significantly less chance SE will be present but the likelihood is still there, they said.

They recommended an aggressive approach to keeping SE out of the poultry house or the use of a feed additive or vaccine with efficacy against this foodborne pathogen.

**SOUND SCIENCE REFERENCES**

Striking a balance with ABF poultry production

BY JOSEPH FEKES

Back in 2013, less than 5% of the chicken produced in the US was raised without antibiotics. Most of it came from small, regional commercial poultry companies. A few large integrators dabbled in antibiotic-free, or ABF, production, either to tap emerging markets or to gain some experience — just in case the day came when they’d have to stop using antibiotics.

Then the day came.
On February 11, 2014, Atlanta-based Chick-fil-A — one of the fastest-growing fast-food chains in the nation — stunned the industry by announcing plans to serve only chicken raised without antibiotics within 5 years.

Not wanting to be outdone, a few other restaurant chains and food retailers — Panera, Chipotle and Papa John’s, to name a few — either reconfirmed or initiated their own plans to serve only poultry meat raised without antibiotics.

The trend also rang a bell at some schools and colleges. In December 2014, for example, six school districts that make up the Urban School Food Alliance — New York City, Los Angeles, Chicago, Dallas, Miami-Dade County and Orlando — announced plans to purchase and serve only poultry raised without antibiotics. The University of Massachusetts-Amherst adopted a similar policy in August 2015.

Meanwhile, FDA was moving ahead with new rules to limit the use in food animals of antibiotics that are considered medically important to humans.

The US poultry industry was also taking measures of its own to curtail antibiotic use. For example, the American Association of Avian Pathologists (AAAP) and the American Veterinary Medical Association issued a joint statement suggesting that the routine use of medically important antibiotics in the hatchery to help prevent bacterial infections in embryos was not “judicious use.”

**Perfect Storm**

So there it was — the perfect storm of market, regulatory and industry initiatives gathering on the horizon and sending a daunting message to the US poultry industry: Stop using antibiotics or, at the very least, cut back on them quickly while exploring sound alternatives.

Almost overnight, ABF production in the US began building steam as more poultry companies announced plans to allocate a percentage of their production to this market.

By 2015, 12% of broiler-feed tonnage was made specifically for ABF programs — a four-fold increase from the previous year, according to Greg Rennier, PhD, of Rennier Associates. (See accompanying article for more numbers.)

**Pushing Back**

Despite its fast growth over the past year, however, not everyone in the US poultry industry was ready to hop aboard the ABF train. Some even suggested taking a different route altogether. For example:

- **The Center for Food Safety** and **American Association for the Prevention of Cruelty to Animals** expressed concern for flock welfare as poultry companies gravitated to ABF production. Their joint statement noted that “eliminating the routine use of these drugs without addressing the birds’ underlying health problems…will only result in worse animal welfare and, potentially, reduced food safety.”

- Not wanting to shut the door on antibiotics altogether, fast-food giant **McDonald’s USA** announced in March 2015 that it would only source chicken raised without antibiotics “that are important to human medicine” according to World Health Organization guidelines. That distinction left the door open for the continued use of ionophores, a class of antibiotics needed to prevent coccidiosis, a highly prevalent and costly parasitic gut disease of poultry.

- At a Wall Street forum in May 2015, the chairman of **Sanderson Farms** — the country’s third largest producer — pushed back on ABF production, telling investors the company had “no plan to withdraw antibiotics from our program.” Joe Sanderson also gave three reasons why: animal welfare, sustainability and food safety. A year later, Sanderson Farms launched an ad campaign claiming that all chicken was antibiotic-free by the time it reached consumers and railed
against what it called “marketing gimmicks designed to mislead consumers and sell products at a higher price.”

• In May 2015, recognizing the inherent risks associated with an all-or-nothing approach to antibiotic management, the Pew Charitable Trusts — a non-profit think tank focused on policy and consumer interests — introduced Certified Responsible Antibiotic Use (CRAU), the first and only USDA-verified standard for antibiotic use. It requires poultry producers to minimize use of antibiotics important to human medicine and use them only under veterinary supervision. Two of the nation’s leading poultry producers now offer CRAU chicken, which many of the country’s major school districts have committed to purchasing and serving, Pew reported. Pew hopes to bring CRAU to the retail level.

• In October 2015, Subway, which has more than 27,000 restaurants in the US, said it was “beginning to transition to serving only protein from animals that have never received antibiotics.” Shortly afterward, Subway clarified its position and said that while its goal is to reduce and eliminate the use of antibiotics in the food it serves, it recognizes antibiotics are “critical tools for keeping animals healthy and that they should be used responsibly to preserve their effectiveness in veterinary and human medicine.”

• On the heels of McDonald’s antibiotic announcement, parent companies of other major strip-mall restaurants — Wendy’s, Pizza Hut, Hardee’s, Olive Garden, Longhorn Steakhouse, Dunkin Donuts, to name a few — served up their policies allowing responsible use of antibiotics for managing disease. “We believe that responsible animal care guided by a veterinarian is essential to producing high-quality, safe food, while also enhancing consumers’ trust and confidence in the food we all share,” Wendy’s said in an August 2016 statement.

The trend also rang a bell at some schools and colleges. In December 2014, for example, six school districts that make up the Urban School Food Alliance — New York City, Los Angeles, Chicago, Dallas, Miami-Dade County and Orlando — announced plans to purchase and serve only poultry raised without antibiotics. The University of Massachusetts-Amherst adopted a similar policy in August 2015.

continued
“On the one hand the antibiotic-free campaigners are publicly demanding that retailers must only source meat, milk and eggs from animals certified by an antibiotic-free program.

Yet on the other they’re saying that it’s acceptable for farmers in these programs to treat their animals with antibiotics on welfare grounds, just as long as they ‘dispose’ of this second-class meat, milk and eggs elsewhere.

So exactly where do they think this (perfectly acceptable) food should go?”

In February 2016, the AAAP issued a position paper strongly defending the rights of licensed veterinarians to treat sick birds with FDA-approved antibiotics that prevent pain and suffering. In a follow-up paper on animal welfare, AAAP reminded the industry that poultry health and welfare “should not be sacrificed in the name of marketing.”

Prior to the landmark Chick-fil-A announcement, the Animal Welfare Institute (AWI) — a non-profit group that established the widely recognized “Five Freedoms” standards — said it supported responsible antibiotic use but spoke out strongly against the ABF initiative. “At best, the antibiotic-free campaign is a naive, ill-conceived, knee-jerk reaction” to the antibiotic controversy, according to an article on the welfare group’s website. It went on to describe ABF production as “nothing more than an elitist marketing ploy.”

AWI also asked a thought-provoking question about the ABF trend that has yet to find a straight answer:

“On the one hand the antibiotic-free campaigners are publicly demanding that retailers must only source meat, milk and eggs from animals certified by an antibiotic-free program.

Yet on the other they’re saying that it’s acceptable for farmers in these programs to treat their animals with antibiotics on welfare grounds, just as long as they ‘dispose’ of this second-class meat, milk and eggs elsewhere.

So exactly where do they think this (perfectly acceptable) food should go?”

ABF production is probably the most polarizing issue facing the US poultry industry — one that implies that poultry raised without antibiotics is healthier, safer or more wholesome, even if there’s no scientific data to support those conclusions.

According to the National Chicken Council, all chicken is “antibiotic-free” in the sense that no violative antibiotic residues are present in the meat due to the withdrawal periods and other precautions required by the government and observed by the chicken companies.

Chicken labeled “raised without antibiotics” or “no antibiotics ever” is from birds not fed antibiotics but, in most flocks, still receive FDA-approved coccidiostats in their feed to help prevent coccidiosis.

Both types of birds are routinely vaccinated to help protect against respiratory and other infectious diseases.

As for product labeling, “antibiotic-free” is not allowed to be used on a label but may be found in marketing materials not regulated by the USDA or FDA. It means the same thing as “raised without antibiotics” or “no antibiotics ever.”
Nevertheless, barring any major production setbacks, it is expected that ABF production will continue to grow — possibly reaching 25% to 30% in 5 years as the industry makes adjustments to meet surging demand.

What’s not certain is how far ABF can go while still being sustainable and meeting the protein needs of all consumers — not just the ones who can afford the higher priced “raised without antibiotics” brands.

**Higher Prices**

While retail prices fluctuate, USDA reports that so-called “specialty” skinless chicken breasts — those from birds raised without antibiotics — cost $4.99 to $5.03 a pound in the last 2 weeks of December 2016. That’s about 150% more than the value-pack chicken breasts ($2.01 to $2.04) that came from conventionally raised birds. During the same period, skinless chicken breasts from certified organic birds cost even more — $7.36 to $7.90 a pound.

Critics of this trend note that while conventionally raised chickens are given FDA-approved antibiotics under veterinary supervision to prevent, control or treat disease, strict medication-withdrawal times and USDA inspections ensure the meat is still free of antibiotic residues (by USDA standards) by the time it reaches consumers. So in essence, it’s all ABF in the meat case or restaurant, but consumers are willing to pay a premium for how the birds are raised.

“Here’s the unfortunate part: If we don’t have a total change in consumer attitudes, we’re going to be in trouble. I’m a big proponent of more judicious use, but I don’t think antibiotic-free production is sustainable for the long term,” said Yvonne Vizzier Thaxton, PhD, professor and director, Center for Food Animal Wellbeing, University of Arkansas.

“We’ve got customers who think they’re eating antibiotics. That’s not true, of course, but we as an industry send that message when we use antibiotic-free as a marketing tool. As long as we keep doing that, or until we can change that perspective, consumers are going to ask for it.”

**Burned by Drought?**

One other unknown to ponder: ABF flocks typically convert feed 5 to 10 points (0.05 to 0.10) less efficiently than broilers with good intestinal health, according to a veterinarian for a leading poultry company with access to production industry statistics. That in turn

Striving for responsible antibiotic use may be a better strategy than going 100% antibiotic-free, according to Peter Spring, a professor and gut-disease specialist at Bern University of Applied Sciences, Switzerland.

Speaking at the 2016 Poultry Science Association meeting in New Orleans, Spring said he does not like the term antibiotic-free and instead prefers that producers strive to be responsible users of antibiotics, according to a report on WattAgNet.com.

He noted that rather than go 100% antibiotic-free, poultry producers in Europe try to use the least amount of antibiotics possible in production. That way, producers don’t run into problems marketing birds that need to be treated.

According to Spring, producing those birds without a way to make use of them would be immoral. US producers might find themselves in trouble in the future if the market for treated birds continues to shrink, he added.
How ABF production will weather the next drought is anyone’s guess, but history suggests that production models built on lower efficiency and higher prices could be more difficult to maintain with rapidly escalating costs for feed, which typically accounts for 70% of live-production costs.

‘Still in for some surprises’

“Antibiotic-free production is not going away, but it’s still in for some surprises,” Thaxton predicted. “A major drought probably would not have an impact on the use of antibiotics, but it most definitely could have an impact on the retail cost of what is already a more expensive product.”

In addition, if market conditions lead to shortages of poultry raised without antibiotics, or if the product became too costly for most consumers, would some fast-food chains need to start asterisking their “no antibiotics ever” menus with disclaimers like “when available”? Even with increased ABF production, Thaxton thinks that scenario is inevitable.

“What happens when retailers can’t find somebody to supply all their ABF birds — whether it’s drought or because they’ve got a recurrence of diseases that we haven’t seen in years, which I think is going to happen in flocks where we stop using antibiotics altogether?” she asked.

“There may not be enough antibiotic-free chicken for their programs at any cost. They’d probably have to do what I call the ‘Chipotle cop-out,’ where they put a sign up saying they’re unable to provide a certain kind of meat at this time.”

Thaxton was referring to reports of Chipotle occasionally running short of poultry, pork or beef raised to the company’s standards and having to use alternatives at some retail locations.

**Wordsmithing ‘antibiotic-free’**

Because all poultry is free of violative antibiotic residues by the time it reaches consumers, it is *Poultry Health Today*’s editorial policy to not use the commonly used phrase “antibiotic-free poultry” when describing poultry raised without antibiotics. However, we do use “antibiotic-free” or its abbreviation, “ABF,” to describe specific feeds, treatments or production programs where no antibiotics are used.

leads to higher production costs, said the veterinarian, who agreed to speak with *Poultry Health Today* but not for attribution, plus more waste in terms of grain, manure and energy.

These losses might be manageable when corn is under $4 a bushel and soybeans under $10, as was the case in 2015 and into 2016. Contrast that with 2012, when a historic drought scorched the US grain belt and drove corn and soybean prices above $7 and $16, respectively. It took 2 years for these prices to return to pre-drought levels.

**Numbers out of context**

There’s also the question of how far poultry ABF initiatives will go to address the real issue: reducing the threat of antibiotic resistance in humans.
Agriculture has long been a target for activists, who like to point out that 70% of antibiotics in the US are used in farm animals. But when one compares a US population of 318 million people to 9 billion broiler chickens, 253 million turkeys, 92 million cattle, 66 million hogs and 5 million sheep, it’s easy to see how antibiotic-consumption numbers get blown out of proportion.

Recognizing that volume is not an accurate measure of antibiotic usage in any species, FDA is working with USDA, Centers for Disease Control and the major animal-health companies to improve data collection on resistance patterns and antimicrobial usage.

In 2016, FDA told Poultry Health Today it had partnered with four states to perform whole-genome sequencing on samples provided by the National Antimicrobial Resistance Monitoring System. The data “will provide unprecedented details on changes in resistance genes from animals and animal-derived foods,” the agency said.

**LIGHTNING ROD**

Another huge issue is human medicine’s contribution to antibiotic resistance. According to a study published in 2016 in the Journal of the American Medical Association (JAMA), nearly one-third of antibiotics prescribed in the US in outpatient settings are unnecessary. Researchers also found that doctors write about 47 million needless antibiotic prescriptions each year, JAMA reported.

It therefore begs the question: Why has the poultry industry become the lightning rod for this issue when, according to Rennier, about 81% of the feed antibiotics used in broiler feeds in 2015 were not on FDA’s list of antibiotics medically important to humans?

Furthermore, the amount of medically important antibiotics used in poultry is expected to become even less as poultry companies comply with FDA’s new veterinary feed directive rules in January 2017.

No one seems to know why poultry is practically alone in consumers’ antibiotic spotlight, but it’s clear that the people who produce poultry meat are working hard to adapt to and meet the needs of all consumers.
Fast growth seen for ABF poultry production, but for how long?

To see how the antibiotic-free (ABF) production trend is playing out with producers’ plans, Poultry Health Today turned to Greg Rennier, PhD, of Rennier Associates Inc., Columbia, Mo., a poultry-market research specialist who tracks product usage in the industry.

Rennier mixes extensive interviews with top poultry complexes, fact checking with industry sources and a proprietary model to compile reports for leading animal-health companies. Poultry Health Today asked the veteran trend-watcher to crunch a few numbers on US broiler antibiotic trends from 2013 to 2015.

**RAPID GROWTH OF ABF**

Rennier reported that 12% of the US broiler-feed tonnage made in 2015* was associated with “no antibiotics ever” programs — a 400% increase over the previous year. Nevertheless, Rennier said, it was equally important to note that while antibiotic usage may be declining, it was by no means going away.

If 12% of broiler feed in 2015 was made specifically for “no antibiotics ever” programs, that means 88% of the feed was produced for birds that were in programs where antibiotics were still fed. While that’s a 9-point drop in antibiotic feeds in only a year, a significant majority of US poultry producers still used antibiotics to prevent, treat and control disease, he said.

Furthermore, a closer analysis of Rennier’s data (see accompanying figures) reveals that the US poultry industry is shifting its approach to antibiotic usage — not abandoning antibiotics altogether.

**FOUR FEED CATEGORIES**

For this report, Poultry Health Today assigned these labels to Rennier’s four broiler-feed categories:

**FULL SPECTRUM**

Some might call this “conventional” production. It keeps the door open to using the full spectrum of FDA-approved poultry feed medications, regardless of whether they’re medically important to humans, but always using them judiciously and under veterinary supervision. They also adhere to mandated withdrawal times so no antibiotic residues enter the food chain.

**REDUCED USE**

Users of this program have made it a policy not to use medically important antibiotics, as designated by FDA. That means they only use ionophores — a class of antibiotics needed to prevent the parasitic disease coccidiosis — and two gut-health antibiotics, BMD (bacitracin methylene disalicylate) and Flavomycin (bambermycins). “There are many antibiotics considered medically important, but basically in
poultry, it means this group has sworn off using virginiamycin and tylosin, which are really the only large-volume poultry antibiotics considered medically important under the new rules,” Rennier said.

This group is also focused on eliminating medically important antibiotics, but it follows World Health Organization (WHO) guidelines and therefore restricts usage to ionophores only.**

These poultry producers never use antibiotics in their feed.

Note: All groups could use coccidiostats such as decoquinate, nicarbazin and zoalene, but these feed additives are not antibiotics and therefore not included in Rennier’s analysis.

3-YEAR REVIEW

In 2015, 34% of the broiler feeds were manufactured under a Full Spectrum program, down from 47% in 2013, Rennier reported (Figure 1). The 13-point decline suggests that more poultry companies are making a conscious effort to avoid using certain poultry antibiotics, even though they are still approved for use by FDA.

According to Rennier, only 18% of the broiler feeds were made under what could be described as Reduced Use programs — down from 23% in 2013 (Figure 1). This decline reflects the poultry industry’s decision to stick with ionophores for coccidiosis prevention but move away from using FDA-approved antibiotics for performance purposes. While it will retain its performance claims under the new FDA rules, one of the antibiotics in this category, BMD, is still used at higher dose rates to prevent, control or treat necrotic enteritis in broilers, he noted.

Figure 1. US broiler-feed tonnage by program type, 2013-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Full Spectrum</th>
<th>Reduced Use</th>
<th>Ionophores Only</th>
<th>No Antibiotics Ever</th>
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<tbody>
<tr>
<td>2015</td>
<td>34%</td>
<td>18%</td>
<td>36%</td>
<td>12%</td>
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<td>2014</td>
<td>45%</td>
<td>22%</td>
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</tr>
<tr>
<td>2013</td>
<td>47%</td>
<td>23%</td>
<td>26%</td>
<td>4%</td>
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</table>

(Reprinted with permission by G. Rennier, Copyright 2016)
Rennier also noted that medically important antibiotics often used in poultry today are administered through the drinking water, under veterinary supervision and only to manage outbreaks of specific diseases.

On the other hand, the **Ionophores Only** category accounted for 36% of the broiler feeds made in 2015 — up from 26% in 2013 (Figure 1). This might reflect the poultry companies’ desire to meet criteria outlined by McDonald’s USA, which follows WHO guidelines instead of FDA’s, or to be flexible with exports to countries following WHO standards.

As noted earlier, the **No Antibiotics Ever** group made up 12% of the broiler-feed usage, a four-fold increase from the previous year (Figure 1).

**HATCHERY ANTIBIOTICS**

Rennier also looked at these same companies’ use of antibiotics in the hatchery to prevent bacterial infections in vaccinated embryos.

In 2015, he estimates that 55% used a hatchery antibiotic, down from 88% in 2013. Numbers in each category are falling quickly, however, so it is premature to release those numbers.

**‘FDA FRIENDLY’**

Irrespective of the broiler-feed programs, Rennier added, 77% to 81% of the feed antibiotics used by the US poultry industry over the past 4 years were what he termed “FDA friendly,” meaning they were not on the agency’s list of medically important antibiotics.

That number should become even higher with the new veterinary feed directive (VFD) rules, which will require producers to obtain a VFD for antibiotics deemed medically important.

Rennier also noted that medically important antibiotics often used in poultry today are administered through the drinking water, under veterinary supervision and only to manage outbreaks of specific diseases.

Looking ahead, Rennier expects the **No Antibiotics Ever** category will continue to grow rapidly and probably account for 18% to 22% of the US poultry market by the end of 2016. By 2017, however, growth might be limited to another 3 to 5 percentage points.

“The US poultry industry is over the hump with antibiotic-free,” Rennier explained. “The 2015 figures show people are in the trial mode — preparing to do what they’ve done in 2016 — and it’s going to take them another year or two to get their learnings under the belt before they start extrapolating that to their other complexes.”

Even so, by 2021, Rennier projects more broiler feed will be made without antibiotics, but it’s difficult to make an accurate prediction until the new VFD rules are fully adopted. At the same time, broiler feed in the **Full Spectrum** category should fall as the industry weans itself from feed medications. The **Reduced Use** and **Ionophores Only** categories will see some fluctuations but probably nothing dramatic.

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* Rennier’s numbers for 2016 will be available this spring. Watch poultryhealthtoday.com for an update.

** Two other poultry feed antibiotics, bambemycin and avilamycin, are “unclassified” by WHO, meaning they are not considered critically important to humans. Bambemycin users were not included in this category, however, because the antibiotic only has performance claims in the US and, therefore, would not be used under WHO guidelines. Avilamycin did not become available for use in US poultry until May 2016.
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Broiler producers who want more diversity in their anticoccidial-rotation plan can now consider the ionophore lasalocid without worrying about it putting a damper on exports, says Jon Schaeffer, DVM, director of poultry veterinary services, Zoetis.

After reviewing data demonstrating the compound is rapidly depleted from tissues, Japan and the EU recently raised the maximum residue limits (MRL) permitted for lasalocid (Table 1). “This should relieve any concerns related to MRLs that US broiler producers have about exporting to these regions,” he says.

Lasalocid is marketed as Avatec® (lasalocid). In the US, it has a zero-day withdrawal time and can be fed all the way to processing, the veterinarian explains.

The former MRLs for lasalocid in Japan existed because the product’s previous sponsors had not filed an application there to establish an MRL. Japan, therefore, defaulted to the lowest level possible —

<table>
<thead>
<tr>
<th>Tissues</th>
<th>Lasalocid MRL (ug/Kg), 2013</th>
<th>Lasalocid MRL (ug/Kg), 2015</th>
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<tr>
<td>SKIN/FAT</td>
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<td>150</td>
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<tr>
<td></td>
<td>10</td>
<td>400</td>
</tr>
</tbody>
</table>

10 ug/Kg — which made it virtually impossible for poultry producers using lasalocid to export their meat to that country, Schaeffer says.

The changes in MRLs for lasalocid should be welcome news for broiler producers looking to add another field-proven anticoccidial to their rotation program, he says.

Lasalocid is a divalent ionophore with a unique molecular structure, Schaeffer explains. It therefore can be used to break up resistance associated with the continuous use of monovalent ionophores such as monensin, narasin and salinomycin.
SUCCESSFUL ABF PRODUCTION:  
Mastered technique or corporate culture?

Galen Miller seemed uneasy about being interviewed. The owner and president of Miller Poultry is a warm, affable guy who’s happy to talk politics, music, food and social trends. But when Poultry Health Today wanted to learn more about his company’s 15 years’ experience raising broilers without antibiotics, he suddenly became tight-lipped — and probably for good reason.
Broiler production is a highly competitive industry so, understandably, Miller wasn’t about to share all his secrets about feed ingredients, water treatments, litter management, brooding, temperature, ventilation or stocking rates.

But after spending a few hours with Miller and his energetic director of live operations, Stephen Shepard, it became clear the company’s success with antibiotic-free (ABF) production wasn’t just rooted in technical know-how.

Interesting point

Asked if Miller Poultry’s rapid growth — 30% over the past year — and command of ABF production might have as much to do with its corporate culture, Miller paused and said candidly, “That’s an interesting point and I’m not sure we’ve ever separated the two.”

He then added, “Antibiotic-free production is costly and comes with a lot of challenges. It takes time to perfect. To make it work, I think it is more about your people, as well as the quality and the integrity of the process.

“It takes a lot of energy and sometimes you ask if it’s worth it,” he continued, “but then it comes back to the whole integrity discussion, you know? So yes, I think our approach to the business is a big part of it.”

And by today’s commercial standards, it is a unique approach.

Brutal winters

Miller Poultry is based in Orland, Indiana, minutes from the Michigan border, 150 miles east of Chicago and some 650 miles north of the broiler-dense regions of Georgia, Alabama, Mississippi and Arkansas. That long distance from other broiler farms is a big plus for biosecurity, Shepard said, but Midwestern winters can be brutal with heavy snow, subzero windchills and relentless disease pressure.

“Winter ventilation, transition ventilation, litter moisture — it’s always a big challenge for us,” he added.

With the help of more than 130 growers in Indiana and Michigan, Miller Poultry now places some 700,000 broiler chicks a week. Most of its growers are Amish and have only one broiler building per farm, each averaging fewer than 30,000 birds. There’s one farm in the company’s network with only 4,000 birds that are actually fed by hand. Of the 700,000 birds in the Miller system, 140,000 are not only antibiotic-free, they’re also certified organic.

“I guess to some people, our setup is kind of like the old days of production — and that has become part of our brand’s story,” Miller said. “But we originally took this approach from a cost standpoint. Antibiotic-free production was new and we didn’t want people to take on a lot of risk or debt. We also thought that limiting the size of each farm was a good way to go from a biosecurity standpoint, which in turn minimized the disease threat and financial risk.”

3.6% mortality

Their one-barn-per-farm approach appears to be working. Shepard reported that Miller Poultry’s average flock morality over the past 12 months has been 3.6%, which rivals much larger producers using antibiotics. More significantly, from a welfare standpoint, it’s less than half what is typically seen in ABF production systems.

As soon as those impressive numbers left his lips, however, Shepard quickly caught himself and insisted that they didn’t measure their company’s success by the monthly Agri Stats report.

“That’s not who we are; that’s not what we use as a guide,” Shepard said. “For us, it’s about treating people as you want to be treated. It’s sometimes hard for people in the poultry industry to make that jump when they first come here, but that’s our culture. That’s not to say our way is better than anyone else’s, but that’s what works for us and our customers.”

Screening growers

As with most modern poultry operations, the Miller Poultry’s growers supply the buildings and the labor. The company furnishes the birds, feed and technical expertise. The difference is in the way the growers are compensated.

Miller shuns what he calls “tournament” types of programs, where grower earnings are tied to their performance against other growers in the network. Instead, the company pays each grower based on
“For us, it’s about treating people as you want to be treated. It’s sometimes hard for people in the poultry industry to make that jump when they first come here, but that’s our culture. That’s not to say our way is better than anyone else’s, but that’s what works for us and our customers.”

GALEN MILLER

pre-determined feed conversion and other performance factors.

“We don’t try to beat up our growers over cost and performance,” Miller said. “Everything has its place and everything needs to be respected, whether it’s the birds, the process, the growers, the environment, the customer, the employee.”

To make its ABF programs work, Miller Poultry also contracts exclusively with hands-on owner managers, who are “screened pretty heavily,” Shepard said. Unless it’s the sole owner and his family taking care of the birds, the company shies away from it.
Ironically, Shepard said, they’ve had particularly good success raising ABF birds with former dairy farmers. “I think dairy is one of the hardest, most difficult forms of agriculture,” he explained. “It requires a high level of commitment and management. Growing chickens without antibiotics seems like a breeze for these guys.”

Production audits from retailers, which review everything from feed ingredients to mortality rates to litter quality, also keep Miller Poultry and its growers on their toes. “Some of our folks think these audits are pretty extreme, but honestly, they’ve made us even better at what we do,” Shepard said.

Finding equilibrium

Miller acknowledged that with large-scale ABF production, there sometimes could be a tug of war between the company’s desire to avoid medications and doing what’s best for the birds.

“There’s a constant struggle between those two [areas]. If you put a lot of energy into it, obtaining good health and welfare is achievable without antibiotics, but often at a significant cost that, frankly, a lot of buyers aren’t willing to pay for,” he said.

“Look at cage-free eggs, for example. People say they want them but they’re not willing to pay the premium and now supply exceeds demand, so there’s a lot of instability in that market right now. It needs to find equilibrium. I think we have that with chicken meat production — there’s a certain market that’s willing to pay for it, but conventional still accounts for most of the production.”

For the same reason, Miller thinks that despite the rapid growth of ABF production over the past 5 years, most of the US poultry industry will stick with so-called conventional production techniques, which involves the judicious use of all FDA-approved antibiotics.

No middle ground

While some food retailers have sought middle ground with policies that only forbid antibiotics deemed medically important to humans, Miller doubts those efforts will gain much traction. “Consumers
Back in 2014, when Stephen Shepard was a poultry specialist for Farm Animal Care Training and Auditing and worked with poultry companies transitioning to ABF production, he expressed concern in a Poultry Health Today article that “if not managed properly,” raising poultry without antibiotics was not sustainable. He cited higher feed costs, higher feed conversions and ABF’s inherent risk to flock welfare and food safety.

Has his position changed since going to work for Miller Poultry 2 years ago?

“I don’t think my perspective has changed at all,” he said. “What’s changed is the number of useful tools — products like the E. coli vaccine, for example — that have made it easier and actually reduced some of the bacteria coming into the plant. So, I still would stand by the phrase ‘if not managed properly.’ That’s the key. If you don’t manage it properly or be proactive, ABF will cause more issues in the field, more mortality. ABF is not for everybody.”

Is ABF sustainable?
Yes, if ‘managed properly’

Miller Poultry consulting veterinarian, Armando Miranda, DVM, says he “agrees 1,000%” that a streamlined decision-making process is essential for a successful ABF program. “As a vet, that’s one of the things that I find very rewarding at Miller — you don’t need to go through three or five layers of management for approval on the selection of a product, the dose, the purchase of the product, the trial we want to run or even the interpretation of results. It’s between one or two people so more gets done and its gets done more quickly.”

Planning for success — and failure

Despite Miller Poultry’s best efforts, Shepard recognizes that after almost 2 years on the job, the day could come when they’ll have no choice but to treat sick birds with an antibiotic and divert them down another channel of production.

In the meantime, he likes chanting a mantra he learned from his good friend and mentor, Mark Burleson, DVM, at Wayne Farms, who told him that “95% of disease issues are helped by poor management” on the farm.

“I strongly believe that to be true and I’ve taken that to heart,” Shepard said. “It goes back to having really high-quality growers and people that spend a lot of time in their barns.”
Miller Poultry now exclusively raises Aviagen Ross 708. While the line has a reputation for being a “big-bird breed” that requires more nutrients than other lines, they seem to have fewer leg problems — a common trouble spot in ABF production, Shepard said — and a higher yield at processing.

Side note: Miller Poultry currently buys all of its hatching eggs but will begin producing a portion of its own breeder pullets and eggs in 2017 — a move that consultant Armando Mirande, DVM, thinks will further ensure healthy ABF and organic broilers.

Coccidiosis and necrotic enteritis (NE) are their biggest health challenges. To help prevent coccidiosis — a prerequisite for managing NE — Miller Poultry leans on vaccines all year long for its organic birds. For the ABF flocks, vaccines are restricted from the end of April to early September. Ionophores are not permitted in ABF production. So, when coccidiostat pressure increases in the cooler months, the company manages the ubiquitous parasitic disease with ABF-approved coccidiostats such as decoquinate (Deccox), nicarbazin (Nicarb) and the latest entry to the field, zoalene (Zoamix), as needed.

“So far we’ve had a lot of success with Zoamix, with good posting results,” Shepard reported. “What’s intriguing about Zoamix is that although it’s a coccidiostat, it acts sort of like an ionophore. We’ll see some leakage, which is good because you get an immunity benefit.”

Not wanting to burn up the traditional coccidiostats, which have been known to develop resistance when used for extended periods, Shepard said they plan their coccidiosis-management regimens 3 years out with the goal of developing a 5-year plan.

“We don’t have a lot of tools at our disposal, so it’s important to be good stewards of the anticoccidials,” he added. “We keep a very, very detailed spreadsheet of every additive that goes into the feed, as well as our vaccination program.”
Looking to further improve 7-day starts, Miller Poultry is experimenting with LED tube lights along the water and feed lines, making the inside of a dimly lighted broiler house look like an airport runway at night. The lighting, Shepard says, attracts the birds and ensures good feed and water intake.

continued on next page
Not wanting any disease pathogen to get too comfortable, Shepard is a firm believer in “rotating everything” — not just feed medications but also some vaccines.

For example, Miller Poultry was a big user of a recombinant vaccine for Marek’s disease and infectious bursal disease (IBD). In recent years, however, they’ve been rotating in traditional live IBD vaccines to get better protection against shedding — a known shortcoming with continuous use of recombinants.

“When we first started using the recombinant IBD vaccine, it was a homerun,” Mirande added. “Great bursas, everybody loved it. But after 1 ½ or 2 years, the honeymoon was over. We found that if we substituted it with a less expensive IBD vaccine for 6 months or so, the recombinant IBD was effective again.”

The veterinarian added that while maintaining healthy bursas was important in any production system, it was especially critical for ABF operations to help optimize immunity.

One other benefit to rotating IBD vaccines: Because producers are limited to using only one HVT (herpesvirus of turkey) recombinant vaccine, resting the Marek’s/IBD recombinant vaccine also gives Miller Poultry the option of using a recombinant vaccine for either Newcastle disease or infectious laryngotracheitis (ILT), if needed.

“We haven’t had to vaccinate for ILT in the past, but we’re getting a heavy amount of layers all around us, all cage-free, and I think we’re going to have to start vaccinating for ILT in the future,” Shepard said.

Another big plus has been vaccinating year-round for Escherichia coli. That’s common practice in the industry for broiler-breeder and layers, Shepard said, but E. coli also can be major in broilers once the hatchery antibiotic has been eliminated.

E. coli typically emerges in broilers as a secondary infection to infectious bronchitis virus or reovirus, he explained, and can lead to high numbers of condemnations in the processing plant when birds are harvested at around 5 pounds. (See E. coli article, page 27.) Miller Poultry administers the E. coli vaccine at day 1 via hatchery spray, sometimes in combination with a coccidiosis vaccine.

“I’m a strong believer in the E. coli vaccine for broilers. Before vaccinating, we had a lot of E. coli showing up at the plant, mostly as sep/tox (septicemia/toxemia),” he said, referring to E. coli, staphylococcus and other organisms that can cause lameness in birds.
**E. Coli** infection: Two types in broilers

While infectious bronchitis virus (IBV) remains a serious threat to broiler health, it often opens the door to costlier secondary *Escherichia coli* infections, explained Kalen Cookson, DVM, director of clinical research at Zoetis, who has worked extensively with the pathogen.

“The IBV challenge typically hits birds at 4 weeks of age. *E. coli* then takes up residence, resulting in high numbers of airsacculitis condemnations in the processing plant, particularly in light birds harvested at 5 weeks of age,” Cookson explained.

On the other hand, operations with larger birds harvested at 7 to 8 weeks are more likely to experience poor growth and higher mortality levels from the *E. coli* infection.

Most IBV serotypes target the respiratory tract, providing an opening for the secondary *E. coli* infection. However, some serotypes have different pathology and target the kidneys.

Producers rely heavily on IBV vaccines to control bronchitis, but this protection is only as good as the serotype match of the infecting strains. “Vaccines with less serotype cross-protection allow for increased *E. coli* secondary infection,” Cookson said, “resulting in decreased protection and higher infection rates for IBV and *E. coli*.”

A viral disease is not a prerequisite for *E. coli* infection in broilers, however. Increased dust and ammonia levels and higher litter moisture can irritate the respiratory epithelium and provide an opening for *E. coli* infections, the veterinarian added.

The bulk of Miller Poultry’s chicken is sold directly to retailers under its flagship brand, Miller Amish Country Poultry, which includes birds raised without antibiotics as well as a certified organic line.

“When a company goes to the extent to put their own name on the product, it adds a whole different element. It becomes personal, real personal,” Miller says on the company website.

Toward that end, his goal is to sell mostly to the retail grocery markets in the Midwest and build customer loyalty.

Still, word gets around and in recent years demand for Miller Poultry’s products spread to other regions. Where they once sold to retailers in a 150-mile radius, Miller Poultry’s chicken can now be found in stores from New York City to New Mexico under the brands Pine Manor Farms, Crystal Valley and Katie’s Best, as well as Miller Amish Country Poultry.

Half of Miller Poultry’s production is now air-chilled, a more expensive process than water chilling that proponents say results in more tender, flavorful meat and a crispier skin when cooked.

As of July 2016, Miller added, all birds are raised on non-GMO diets.
Condemnations are among the most frustrating aspects of poultry production.
Recently, I was asked by a major US broiler producer to help figure out the cause of condemnations. This is something I’ve done periodically for over 25 years as a consultant and, for the last several years, on behalf of Zoetis.

Condemnations are among the most frustrating aspects of poultry production. Consider what it takes to produce broilers. There’s housing and managing breeder flocks, the hatchery process and raising chicks on farms. It’s a huge endeavor.

When carcasses are rejected at processing, all the time and money that went into production is lost. Couple that with even slight increases in the condemnation rate, and the losses really mount.

**Reasons for rejection**

USDA’s Food Safety and Inspection Service (FSIS) reports a post-mortem condemnation rate of 0.96% for federally inspected chickens in 2015, up from 0.94% in 2014. In my experience, a 1% condemnation rate isn’t uncommon and a 2% rate would be considered extreme.

There’s a long list of reasons chicken carcasses or parts are rejected upon inspection, but it’s generally when USDA inspectors find fecal contamination or signs of disease. Sometimes, it’s not readily apparent if a carcass should be rejected or not, and inspectors understandably err on the side of food safety.

Among diseases that lead to rejection, septicemia/toxemia tops the list. It’s a catchall category for birds with severe generalized conditions. I also see a lot of airsacculitis, as well as ascites — a fluid buildup in the abdomen.

Inflammatory process (IP) is a common finding upon inspection and doesn’t usually result in condemnation of the carcass, but it often results in trimming that can lead to substantial additional losses.

I do a gut check to examine the viscera to make sure feed was withdrawn correctly — about 10 hours before processing. If there’s feed in the intestines, it increases the chances for contamination and condemnation.

Next, I introduce myself to the USDA inspectors and explain why I’m there. I usually invite the USDA veterinarian in charge to join me in reviewing the rejected carcasses that have been tossed into a yellow trash receptacle, where the meat is denatured with a colored dye to ensure it will never be consumed by humans.

For some problems that are localized and don’t affect the entire bird, regulations allow for trimming versus tossing the whole carcass. Inspectors also have the option of setting aside carcasses they aren’t sure about for review by the USDA veterinarian, who makes the final call.

**Judgment calls**

On my recent visit to a processing plant, I found nothing regarding animal welfare or the slaughter process that would result in condemnations. This day, I worked through two 8-hour shifts with two different inspectors and the USDA veterinarian in charge of each shift.

It was my opinion that over 50% of carcass condemnations were unnecessary. I thought there were some inaccurate judgment calls for septicemia/toxemia, and there was a second group condemned for IP that I believed could be salvaged with trimming.

**Evaluating the process**

When I’m asked to help figure out the cause of condemnations, I start at the beginning of processing. I weigh a sample of birds to check for uniformity.

I consider bird handling and animal welfare because rough handling can adversely affect the carcass. I see if the processing lines are operating correctly.

continued
I encourage producers to cultivate and maintain a cordial relationship with USDA inspectors and veterinarians.

By reviewing the inspector’s decisions and explaining my findings, it was possible to reduce the condemnation rate from 1% to 0.5%. For a producer processing 1 million 7-pound birds per week at 85 cents per pound, this reduction in condemnations amounts to a savings of $1,160,250 per year.

It’s important to keep in mind that the job of poultry inspection is grueling work, that an inspector has only a few seconds to examine each bird and the inspector has a responsibility for food safety. It’s my experience, however, that some inspectors would welcome and benefit from additional training by a poultry veterinarian. It can be difficult to make judgment calls in a split second, especially when a problem with a carcass isn’t black and white. Additional training could help inspectors be more confident and make more accurate decisions.

Working in partnership

This process of exploring the reasons for condemnation can go a long way toward reducing losses, as my most recent day at the processing plant illustrates. Over the years I’ve heard complaints from within the poultry industry that USDA-FSIS was a “command and control” operation, but that’s changed. USDA has made an effort to work in partnership with producers.

I encourage producers to cultivate and maintain a cordial relationship with USDA inspectors and veterinarians. Periodically working shoulder-to-shoulder, looking at condemnations together and agreeing or disagreeing keeps the process more centered. It’s a good idea to also enlist the participation of the USDA veterinarian for review of carcasses set aside when inspectors aren’t sure what to do.

Look at live production

There’s another way that review of processing plant procedures and rejected carcasses can help reduce condemnations. If problems such as bird handling during processing aren’t the cause, the findings might point to live-production problems that aren’t apparent by just walking around a poultry farm.

If bird size and weight are inconsistent, that can suggest problems with subclinical coccidiosis and other diseases that can hurt flock health, welfare and performance.

A high incidence of condemnations due to airsacculitis which, as I mentioned, I see a lot of, can be due to poor house ventilation, but it’s often caused by opportunistic Escherichia coli infection that leads to septicemia. E. coli can take hold in broilers affected with variant strains of infectious bronchitis, rendering a one-two punch to the bird. The solution may be improved management of infectious bronchitis and perhaps vaccination against E. coli.

Ascites might be due to husbandry practices, the diet or conditions that reduce oxygen. If the cause is heart failure that results from fast growth, lighting programs probably need changing.

When there’s a high rate of carcasses that need to be trimmed due to IP, producers will want to rule out wet floor conditions. Another possible cause is poor intestinal health due to coccidiosis that sometimes leads to necrotic enteritis. Improved coccidiosis management may be in order.

Getting a good handle on the cause of condemnations and the need for trimming includes both exploring live-production problems as well as working with USDA inspectors.

Everyone involved in the poultry industry — veterinarians, the poultry production staff, the processing staff as well as inspectors — has the same objective, which is to produce a safe and wholesome product for consumers. It’s also essential that poultry producers remain sustainable, and that requires minimizing losses wherever possible. These goals can be achieved if we all keep them in mind.

1 USDA Poultry Slaughter 2015 Summary.
Most US poultry companies are doing an “outstanding job” controlling Salmonella — not only in processing but in live production, too, as producers supplement biosecurity measures with strategic vaccination programs, according to Charles Hofacre, DVM, PhD, professor and director of clinical services, University of Georgia.

Hofacre was responding to a 2016 interim report from FDA. Although the report raised concern about certain forms of antibiotic resistance, the prevalence of Salmonella in retail poultry has dropped from 15% in 2008 to 9% in 2014.

Still, there’s always room for improvement, he said — even more so now with the new USDA/Food Safety and Inspection Service (FSIS) standards for Salmonella and Campylobacter in ground poultry and poultry parts. (See chart on page 33.)

“Salmonella in breeders is like a drippy faucet,” the veterinarian cautioned. “If it keeps dripping into broilers, it makes the level high enough that the processing plant has trouble meeting its goals and targets set by the government’s Food Safety and Inspection Service.

“A lot of companies have begun to realize it’s better to focus on breeder vaccination and get ahead of the game,” Hofacre said in an interview with Poultry Health Today.

There’s no one remedy that will completely eliminate foodborne Salmonella. However, “even if you have a bloom of a particular Salmonella type in the hatchery that could infect a large number of broiler farms, it can be kept to a manageable level if hens are properly
vaccinated because they’re passing on maternal antibodies. The processing plant can deal with lower levels of the pathogen,” said Hofacre, who has conducted extensive Salmonella research.

**TWO-STEP PROCESS**

Vaccination of breeders against *Salmonella* is usually a two-step process, he said. An example would be vaccination of young pullets with live vaccines, usually on days 1 and 14 and 5 to 8 weeks of age. Once they’ve reached the age they’ll be handled — about 10 or 12 weeks of age — it’s important to properly vaccinate them with an inactivated commercial or autogenous vaccine that matches the *Salmonella* challenge. In some flocks, a second inactivated vaccine will be given.

Vaccine selection is critical, however.

“If you have *Salmonella* Heidelberg or *Salmonella* Enteritidis in the system, you don’t want to have a vaccine that contains five other *Salmonella* types besides Enteritidis or Heidelberg. Focus on the type of *Salmonella* that has the greatest potential for causing a problem,” Hofacre advised.

Many companies opt to make their own autogenous vaccines for this later stage of production. These products are often used successfully but don’t always provide the same peace of mind as commercial vaccines. “With autogenous, you just don’t know how immunogenic those isolates are” because potency and efficacy testing of autogenous vaccines isn’t evaluated by the USDA, he said. For this reason, he prefers the use of commercial vaccines.

**VACCINATION OF BROILERS?**

Should broilers also be vaccinated? That can be a costly option, but there are two situations when Hofacre advises vaccinating broilers against *Salmonella*:

1. **If there’s a high load of *Salmonella* coming into the processing plant — more than the plant can deal with**

2. **When foodborne types of *Salmonella* that affect human health, such as S. Heidelberg, S. Typhimurium or S. Enteritidis, are identified in the system**

“A broiler-vaccination program can help get those down to levels the plant can knock out. We’re talking about doses [of *Salmonella* pathogens]. If you get the dose down, there’s still a risk for human illness, but there’s a much lower risk,” he said.

An alternative approach to vaccination would be the use of competitive-exclusion (CE) products, which are used just about everywhere in the world. In breeders, they may help protect young pullets from day-of-age up until the time an inactivated vaccine is used. In broilers, they might be used either with or in lieu of a live vaccine, Hofacre said. “There’s a real reluctance on FDA’s part to continued
The chart below, from the USDA FSIS, shows the maximum acceptable percent-positive results before the establishment fails to meet the performance standard. A test is considered positive when any *Salmonella* or *Campylobacter* organisms are found.

### Salmonella / *Campylobacter* Performance Standards for Poultry

<table>
<thead>
<tr>
<th>Product</th>
<th>Maximum Acceptable % Positive</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Salmonella</em></td>
<td><em>Campylobacter</em></td>
</tr>
<tr>
<td><strong>BROILER CARCASSES</strong>*</td>
<td>7.5</td>
<td>10.4</td>
</tr>
<tr>
<td><strong>TURKEY CARCASSES</strong>**</td>
<td>1.7</td>
<td>0.79</td>
</tr>
<tr>
<td><strong>COMMINUTED CHICKEN</strong>*</td>
<td>25.0</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>COMMINUTED TURKEY</strong>*</td>
<td>13.5</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>CHICKEN PARTS</strong>*</td>
<td>15.4</td>
<td>7.7</td>
</tr>
</tbody>
</table>

* The maximum percent positive for *Salmonella* and *Campylobacter* under the performance standards for young chicken and turkey carcasses is listed in FSIS Directive 10.250.1

** Developed proposed performance standards published in the FRN Docket No. FSIS-2014-0023
In a candid, 90-minute interview with editors from Poultry Health Today and the VFD News Center, William Flynn, DVM, MS, deputy director for science and policy for FDA’s Center for Veterinary Medicine, clarified some hazy points of the new veterinary feed directive (VFD) regulations. Here he fields questions about syncing the labels of mature VFD medications to today’s health problems.

For the full interview, go to poultryhealthtoday.com/flynn.

Interpreting the language of the new VFD rule

approve the undefined CE products, however,” he added. “It would be nice to have more discussion and input from experts regarding the use of undefined CE.”

OTHER STEPS

Other Salmonella-control measures producers should take will vary — not only from company to company but from complex to complex within the same company, Hofacre has found.

For example, darkling beetles, which can transmit Salmonella, may be a problem on some farms and not on other farms; perhaps a Salmonella in the hatchery is causing a bloom of the pathogen in broilers. The source of Salmonella needs to be pinpointed as well as the types of Salmonella involved; otherwise it is difficult to impossible to initiate appropriate remedies.

Hofacre sees additional opportunities for improving Salmonella control in processing. For example, he said, the industry is learning it’s better to use an agitated dip with chemical intervention versus simply rinsing carcasses with large volumes of sprayed water. “Agitated dips with chemical intervention appear to be working much better than anything else at the plant” for Salmonella control, he added.

Asked about the role of veterinarians regarding Salmonella control, Hofacre said they provide a bridge between the live-production and processing-plant staff to achieve good control.

“Veterinarians are best suited for determining areas that need attention within a system and for developing a Salmonella management and monitoring program,” he said. “Producers should lean on their veterinarians for these purposes.”
Many of today’s feed medications were registered more than 40 or 50 years ago. They’ve been used responsibly and, as a result, they’re still highly effective against a broad range of respiratory or enteric diseases. Yet, when these products were registered, management practices, facilities and disease pressures were considerably different than they are today. If veterinarians are confident that a particular broad-spectrum antibiotic is going to be effective against the problem at hand but there’s not an exact match on the VFD product label, what options do they have?

WF: Under the VFD regulations, veterinarians are limited to using that product according to the label — the specific indications of use and conditions of use that are outlined on that product label. In some cases, the labels are very, very specific regarding the indications for use and that limits the flexibility they have, but in other cases, the labels are a little bit broader.

Q: OK, but let’s say we have a house of chickens with an obvious respiratory or enteric problem and the veterinarian needs to do something quickly to manage the outbreak and relieve suffering. The vet is not exactly sure what pathogens are in play. But if he or she thinks that, say, chlortetracycline or tylosin might be effective, could he or she look at the label and say, “Well, there’s a good chance that one of those bugs on the label is in there, so I’ll check this box and go on my gut feeling.” Is that a reasonable course of action given the circumstances?

WF: Yes, if they have a respiratory disease, for instance, and are reaching for a VFD drug that is approved in feed for treating respiratory disease in that animal, that would be acceptable. In these cases, we need to look to the veterinarians to use their clinical judgment. This goes back to that general or preliminary diagnosis in the VCPR (veterinarian-client-patient relationship).

For VFD or prescription products, our main concern is that there’s veterinary oversight. That’s our primary objective — that the veterinarian is involved and is consulting with the producer and helping make decisions around the use of that product and selecting the product for the given circumstance, based on their judgment of that circumstance.

WF: There is a legal obligation to use the product on label. I’ll use respiratory disease in cattle as an example. You may have Product A that’s approved for respiratory disease and Product B that’s approved for foot rot but not for respiratory disease. If they’re making a diagnosis of respiratory disease, then obviously, they need to be reaching for and authorizing the use of a product that has a respiratory disease on the label. They can’t authorize a product that only has a foot rot claim for treatment of respiratory disease. But in terms of diagnosing respiratory disease, we’re not interested in second-guessing the veterinarian. The veterinarian needs to use clinical judgment to determine whether they are in fact dealing with respiratory disease.

Q: So, just to be clear for our readers, if there’s a respiratory disease and there’s a specific antibiotic the veterinarian feels will be effective and it at least has one respiratory claim, the veterinarian in his or her clinical judgment and experience could feel confident issuing a VFD for that product. Is that correct?

WF: Yes, that’s accurate. Labels on these products are sometimes more specific and sometimes not. Some may specify respiratory disease associated with bacteria X, Y or Z. The veterinarian may not have confirmed diagnostics that prove it’s bacteria X, Y or Z, but if the clinical syndrome is one they feel, based on experience, is consistent with that respiratory disease and the history suggests it’s often associated with one of those bacteria, then, yes — I think that would be acceptable. It’s not as though we’re saying a veterinarian is obligated to get more diagnostics if their clinical judgment leads them to believe this is the appropriate product to use.
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In Poultry Health Today’s special report beginning on page 19, Miller Poultry’s live-production manager, Stephen Shepard, oozes enthusiasm for antibiotic-free (ABF) production. And who can blame him? He and the company’s visionary owner and president, Galen Miller, are having tremendous success with their program — an accomplishment they attribute more to their management style and corporate culture than technique.

Despite their success, however, Stephen also makes this candid point: “ABF is not for everybody.”

Many consumers think “antibiotic-free” has a wholesome ring to it, so I’m not surprised there’s a growing market for poultry raised without antibiotics. That Miller Poultry and large integrators — Perdue, Tyson and Wayne Farms, to name a few — are helping to meet this demand demonstrates the innovation and can-do spirit of our industry.

While there’s a segment of our population that wants and can afford these specialty products, we know there’s a much larger one that cannot. In fact, according to the US Census Bureau, half of US households in 2015 had incomes less than $54,462. Given the choice between $2 chicken and $5 or even $8 chicken, which product are these folks going to choose?

Our diversity in production is commendable, but we as an industry also need to remember the diversity of our market when making statements about poultry. It’s fine to produce and promote poultry raised with “no antibiotics ever.” But for everyone’s sake, let’s not do it in a way that suggests there’s something wrong, less wholesome or even harmful about conventionally raised poultry — a group that makes up at least 80% of our market. That opportunistic approach not only hurts our industry, it also potentially offends and alienates the billions of diehard poultry enthusiasts scrimping to afford that $2-a-pound value pack for their families.

Shortly before the Great Depression, a presidential campaign flyer promised Americans “a chicken in every pot.” That should still be the US poultry industry’s goal, but we won’t get there if it all needs to be raised without antibiotics and sold at a 150% premium.

...not every poultry producer has the business model, market or even the inclination to deliberately withhold FDA-approved medications from their birds.

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Once again, ‘ABF is not for everybody’

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Still, ‘ABF is not for everybody’

While the industry moves ahead with ABF production, we must recognize — and also respect — that not every poultry producer has the business model, market or even the inclination to deliberately withhold FDA-approved medications from their birds. Many have pledged to keep using them responsibly, under veterinary supervision, to ensure flock health, welfare and food safety. The new veterinary feed directive rules also provide added insurance they’ll be used at the right time for the right reason.

Likewise, we know that chicken from ABF production systems is not for every consumer. As reported in our cover story (pp. 7-16), so-called “specialty” skinless chicken breasts — those from birds raised without antibiotics — cost about $5 a pound or 150% more than value-pack chicken breasts from conventionally raised birds, according to USDA. During the same period (late December 2016), skinless chicken breasts from certified organic birds cost even more — $7.36 to $7.90.

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Was 2016 the ‘year of the white chick’?

Increasing reports of “white chicks” have emerged from all corners of the chicken-producing world, according to regular contributor Phil Stayer, DVM, head veterinarian for Sanderson Farms. “White chicks” are just that — day-of-age broilers with unusually white down, typically intermingled with more normal yellow-colored hatch-mates. They tend to be smaller in stature and less thrifty than other chicks.

Get to know lesser-known risk factors of NE in broilers

Hopes for better necrotic enteritis control in the “post-antibiotic era” hinge on the “nuts and bolts of the disease process within the bird” and potential methods of disrupting those pathological processes, writes John Smith, DVM. “Getting a clearer picture of flock management and environmental risk factors will be equally important but, to date, have been poorly explored methods of control.”

Four tips for taking the lead on the animal-welfare conversation

Pointing to growing opportunities for farm employees to work undercover for animal-rights groups, consulting nutritionist Carla Price, PhD, says poultry companies should hold all farm personnel — including the so-called double agents with hidden cameras — accountable to management for reporting possible violations to company welfare guidelines.

Want more news and information on poultry health?
Vaccinating for Marek’s? The ‘devil is in the details’

A natural challenge to the Marek’s disease (MD) virus begins immediately after placing chicks into a highly contaminated house, so the success of a vaccination program is dependent on rapid onset of immunity, writes Don Ritter, DVM, Mountaire Farms. “The vaccines are basically in a foot race with virulent field strains of the MD virus to replicate and immunize the chicken to prevent tumor formation and immunosuppression.”

Reducing your poultry farm’s carbon footprint

When it comes to greenhouse gases (GHGs) and their effects on climate change, there’s often a lot of finger-pointing at poultry and other modern food-animal production practices, says Claudia Dunkley, PhD, University of Georgia. “The majority of GHGs associated with poultry don’t originate from poultry production at all. They’re associated with feed production, which the poultry grower can’t control.”

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