

Hormel Foods
Antibiotic Stewardship Report

January 2021



Welcome to our first Antibiotic Stewardship Report. Hormel Foods, named one of America's Most Responsible Companies by Newsweek and one of the 100 Best Corporate Citizens by 3BL Media, has published its annual corporate responsibility report for 14 years. Through *Our Food Journey*[™] we are committed to transparency and truly making a difference in the world. We know that building social value and creating economic value are not competing goals, and we are proud to share with our stakeholders this special supplemental report that provides more information on our antibiotic stewardship efforts as well as presents metrics for some of the farms in our supply chain.

Our antibiotic stewardship and leadership are well documented on our company's website and in various publications. We have not only invested in raising animals without antibiotics, we have also been stewards of alternative approaches to animal health and wellbeing in an effort to minimize the need for antibiotics. We never use medically important antibiotics for growth promotion, feed efficiency or weight gain.

We commit to furthering our partnership work with leading experts in animal and human health, science and technology to continue to make a difference in this important area.

The background is a blurred landscape. In the foreground, there is a field of green grass. In the middle ground, there is a body of water, possibly a lake or a wide river. In the distance, there is a building with a light-colored roof and a dark structure, possibly a tower or a chimney, rising from the water's edge. The sky is a pale, hazy blue.

INTRODUCTION



By Dr. Michelle Kromm, Vice President of Animal Health and Welfare, Hormel Foods

Michelle Kromm is a boarded member of the American College of Poultry Veterinarians and earned a Doctor of Veterinary Medicine from Iowa State University, a Master of Public Health from the University of Iowa and a Master of Avian Medicine from the University of Georgia. She joined Jennie-O Turkey Store, a subsidiary of Hormel Foods, in 2007 as a staff veterinarian.

The issue of antibiotic resistance is a complex, multifaceted issue facing society. At Hormel Foods, we believe an impact to antibiotic resistance will only come through a holistic approach to antibiotic stewardship, aided by key partnerships to create an impact beyond our supply chain. It's through stewardship that we can make an impact on antibiotic resistance, while maintaining one of our core cultural beliefs – putting the health wellbeing of animals first.

When components of an antibiotic stewardship program function effectively, the health of the animals is optimized while the occurrence and impact of disease are minimized. The antibiotic stewardship program at Hormel Foods, which includes our subsidiaries, is based on four principals: management, preventive medicine, veterinary oversight and continuous improvement. Let's take a closer look at each of these important components.

MANAGEMENT

Production and housing systems that address the basic needs of the animals and are designed to minimize the risk of disease introduction are the foundation on which the other principles are built. Providing the appropriate environment, including housing and temperature, increases the animals' resiliency to infection and disease by supporting

the development of a healthy immune system. Systematic segregation of groups of animals based on health status is an additional tool utilized to address the welfare needs of at-risk populations.

PREVENTIVE MEDICINE

The next layer of our antibiotic stewardship program is comprised of preventive medicine programs. Veterinarians use their expertise to develop programs and procedures that focus on disease mitigation. A farm's preventive medicine program addresses potential routes of disease introduction (often referred to as biosecurity), as well as strategies to support the overall health and welfare of the animals. Components of this principle include sanitation protocols, appropriate barn entry procedures and vaccine programs to protect animals from common pathogens.

VETERINARY OVERSIGHT

Veterinary oversight is critical to ensure judicious antibiotic use. Veterinarians have a deep understanding of disease processes, the development of antimicrobial resistance (AMR) and animal welfare. Therefore, they have the expertise to navigate the interrelationships among antibiotic use, preservation of animal welfare and potential impact to public health.

CONTINUOUS IMPROVEMENT

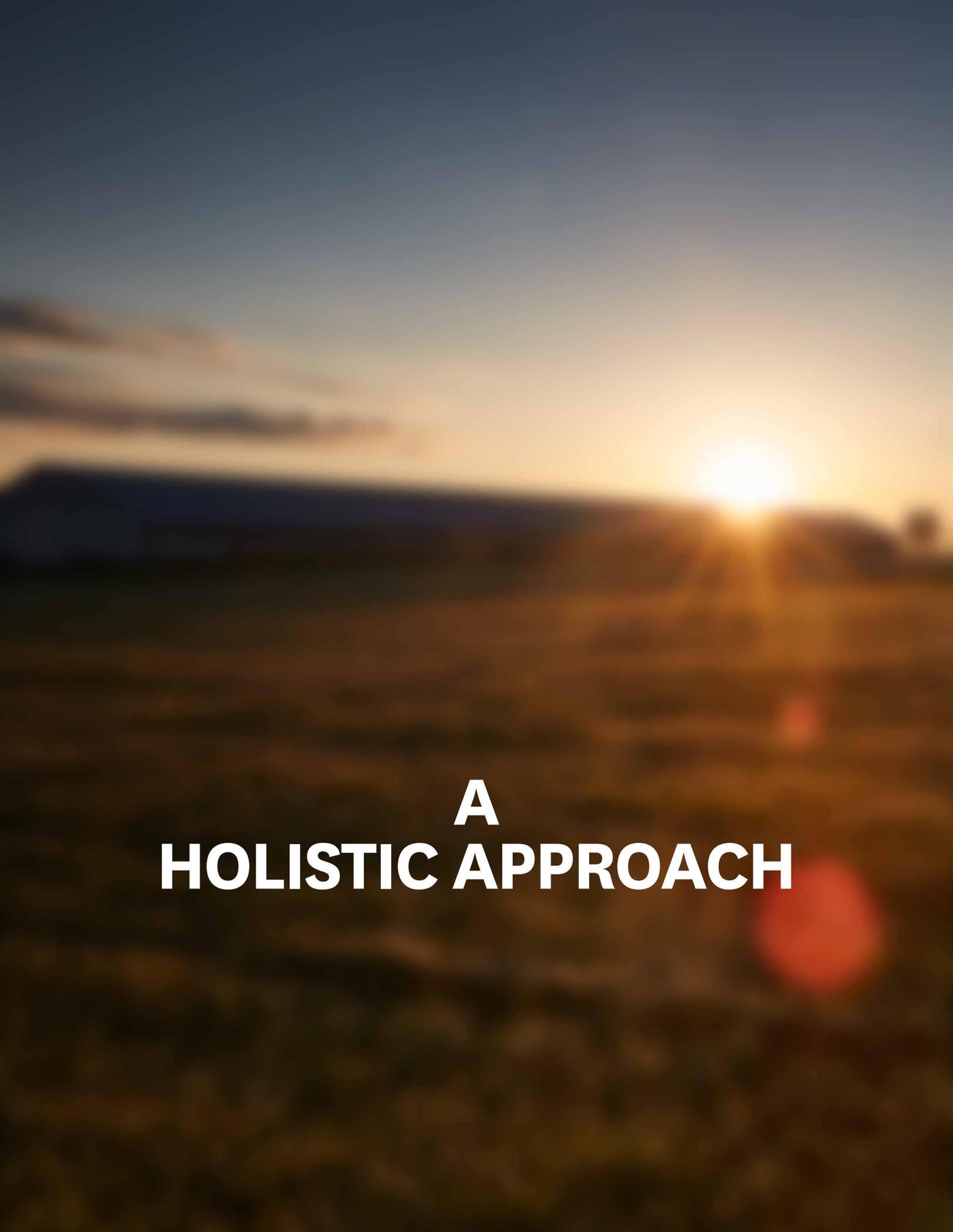
A commitment to continuous improvement is the final principle of our antibiotic stewardship program. As part of our commitment, we're sharing the quantities of antibiotics administered to animals in various parts of our supply chain in this report. However, a myopic approach, solely focused on absolute antibiotic use, has the potential to create unacceptable tradeoffs between animal health and welfare, as does the expectation for consistent reduction in antibiotic use over time. We believe that if an animal is sick, it should be treated, and much like human health, there are times when animals are impacted by health issues. While we know our farm partners do their best to prevent health issues on the farms, in some cases illness is unavoidable and must be treated. To provide a more complete view, this report also provides insights about our investments in antibiotic alternatives such as probiotics, prebiotics and essential oils. Continual refinement of management and preventive medicine programs, engagement with veterinary experts and a commitment to continual improvement are all critical principles of our antibiotic stewardship program.



**OUR
FOCUS AREAS**

At Hormel Foods, we understand the importance of using antibiotics responsibly in all settings, including animal agriculture. Protecting human health and the health of our animals is of the utmost importance, and we are proud of our ongoing stewardship efforts. We focus our efforts the following ways:

- **Taking a holistic approach to antibiotic stewardship** – Improving health outcomes for the animals in our supply chain is the most effective and sustainable way to improve antibiotic use practices. The four core principles to our stewardship program include:
 - Managing systems and housing to provide the appropriate environment;
 - Utilizing preventive medicine programs to support the health of the animals;
 - Partnering with veterinarians to ensure antibiotic treatment is necessary and appropriate; and
 - Continually evaluating, investing in and improving our antibiotic stewardship program.
- **Partnering with stakeholders** – Antimicrobial resistance is a multifaceted issue that requires collaboration across all stakeholders. It is only through partnerships that we have a chance to make a significant impact on the emergence of antibiotic resistance. In 2015, we formed an Antibiotic Working Group comprised of internal subject-matter experts, leading nongovernmental organizations, including the Pew Charitable Trusts and Farm Foundation, independent veterinarians and other stakeholders to discuss and continue to advance this important industry topic. We also review and explore research opportunities and participate in industry antibiotic initiatives. Additionally, we are working to support broader dialog around the challenges of addressing AMR through membership in the Business Council of the United Nations as well as the National Institute of Antimicrobial Resistance Research and Education.
- **Producing raised-without-antibiotics products** – Hormel Foods has invested in producing raised-without-antibiotics products. In fact, our purchase of Applegate Farms, LLC. is a significant commitment in this regard. Our *Applegate*[®] product portfolio is produced entirely from animals raised without antibiotics. If antibiotics are given to an animal, that animal does not enter the Applegate supply chain. In addition, we offer several raised-without-antibiotics foodservice items, *Columbus*[®] products and *Jennie-O*[®] products.



**A
HOLISTIC APPROACH**

We are committed to taking a holistic approach to animal care — one that puts the health and comfort of the animals first. Our team is dedicated to the development of sound management and preventive medicine programs that minimize the need for antibiotic treatment. These programs include providing appropriate shelter, feed and water in order to keep the animals comfortable, establishing on-farm procedures to reduce disease introduction and using vaccine programs developed by veterinarians to minimize the occurrence and impact of disease. If it becomes medically necessary to treat the animals in our care, we focus on using the most appropriate antibiotic.

MANAGEMENT

There are several systems changes our partners have made to improve the health outcomes of hogs and turkeys within our supply chain. For example, within our hog supply chain these changes include increasing the age at which pigs are weaned, leading to more robust piglets, batch farrowing at some sow farms and minimized sourcing of pigs for market hog sites. Both of these latter strategies minimize the mixing of pigs of differing health statuses. Both our hog supply partners and our Jennie-O subsidiary segregate offspring of breeding stock when they first come into production. Often, the piglets and turkey poults from the start of a reproductive cycle require extra attention and care. Through segregation, our farms can improve the health outcomes for these specific groups of at-risk animals. Although these system changes take months to years to institute, they are critical to improving health outcomes for the hogs and turkeys in our supply chain.

Utilizing the available technology to ensure environmental conditions are comfortable and consistent is another key focus area for our turkey and hog suppliers. The use of computerized barn monitoring systems allows for the constant measurement and adjustment of environmental conditions such as temperature, humidity and ventilation rates to ensure animals are comfortable. Many monitoring systems also capture feed and water consumption patterns. This information is particularly useful as reduced feed and water consumption are often the first indicators that animals aren't feeling well, which trigger early intervention through supportive care (such as providing a little more heat or providing vitamins or probiotics in the water), potentially avoiding antibiotic treatment all together.

PREVENTIVE MEDICINE

There are two main aspects of disease prevention that need to be addressed in a comprehensive program. First, procedures and policies need to be in place to mitigate the various ways in which diseases are introduced to a farm or barn, broadly known as biosecurity. Biosecurity programs cover a wide variety of mitigation strategies. Biosecurity efforts at the farms represented in this report include: all individuals entering a barn of breeding stock are required to shower in/shower out; site-specific clothing, footwear and gloves are worn at all commercial hog and turkey farms; and thorough sanitation practices are in place for all transportation trucks.

The second aspect of preventive medicine is direct support of the health of the animals. The cornerstone of this aspect is a vaccine program that targets common pathogens – the viruses and/or bacteria that cause disease. Additionally, partners within our hog supply chain are focused on water filtration and treatment to help support young pigs as they are often challenged by gastrointestinal upset early in life. Animal feed composed of quality ingredients and containing the proper nutrients is critical to support health and development. It is a common practice to screen feed ingredients for contaminants, such as toxins produced by moldy ingredients.

VETERINARY OVERSIGHT

We employ seven veterinarians at our Jennie-O Turkey Store subsidiary and have partnered with a leading animal veterinary clinic to help define long-term health strategies for our company-owned sow farm. Each farm in our supplier network is also required to have veterinary oversight. This network of consulting veterinarians is equally committed to understand ways to minimize antibiotics by innovating in areas of animal husbandry. In addition, veterinarians monitor and evaluate the health and welfare of all our animals, as well as our antibiotic use, on an ongoing basis. For example, when a Jennie-O staff veterinarian determines it's necessary to use an antibiotic to minimize the welfare impacts of an illness, they first ensure antibiotic efficacy against the bacteria causing the disease. To do this, before an antibiotic is prescribed, the team at Jennie-O does additional testing to pick an antibiotic that is going to kill the unwanted bacteria. This procedure is called a sensitivity test, and it ensures that only antibiotics that will reduce the impact of disease are prescribed.

CONTINUOUS IMPROVEMENT

A great example of our company's continuous improvement efforts is Jennie-O's commitment to antibiotic alternatives research that began in 1991. Jennie-O is currently using three types of alternatives as part of the preventive medicine program developed by the company's veterinary and nutrition staff: prebiotics, probiotics and essential oils. In fact, the team at its research facility in Barron, Wis., has conducted 58 trials testing antibiotic alternatives, with over half of those studies happening in the last five years. Those that have demonstrated value are integrated into the feeding program or are being used as a supportive therapy in the drinking water.

Below are just a couple examples of the studies conducted by Jennie-O in the last year:

- One study involved looking into ways to reduce cases of colibacillosis, a common bacterial infection caused by *E. coli*. The team studied a probiotic composed of different bacillus strains to better help reduce *E. coli* in the birds and their environment. The results of this study indicated that adding the probiotic into the feed reduces the incidence of bacterial infection, and therefore reduces the need for antibiotic treatment.
- A second study used herbal extracts to combat turkey clostridial dermatitis (CD), a bacterial infection that greatly impacts older turkeys. Treating dermatitis can be very costly and increases the amount of antibiotics, especially penicillin, needed to combat the disease. The team is now conducting a field study to see if adding a product comprised mostly of herbal extracts to the feed can decrease the impact of dermatitis and minimize the company's penicillin usage.

While the company only owns one sow farm on the pork side of its business, we are employing similar measures and constantly exploring ways to improve animal health in an effort to eliminate antibiotic use where we can.



PARTNERING WITH STAKEHOLDERS

In addition to the company's Antibiotic Working Group, and membership in the Business Council of the United Nations and National Institute of Antimicrobial Resistance Research and Education mentioned previously in this report, in calendar year 2018, Hormel Foods, along with other food companies, retailers, livestock producers and trade and professional associations, announced a comprehensive framework to strengthen stewardship of antibiotic use in food animals. The framework was part of a two-year dialogue with stakeholders, moderated by the Farm Foundation and Pew Charitable Trusts, to ensure that antibiotics are used judiciously throughout production to protect animal and public health.

The 15 core components of the antibiotic stewardship framework are based on the importance of veterinary guidance and partnership, disease prevention strategies and optimal treatment approaches, as well as effective record keeping and a culture of continuous improvement and commitment to antibiotic stewardship. The components address education, implementation and evaluation steps for phasing in stewardship programs. The framework's guiding principles are intended to help ensure that stewardship programs have a clear scientific basis, are transparent, minimize the risk of unintended consequences, encourage alternatives to antibiotics and focus on long-term sustainability.

Additionally, we recognize customers and consumers expect more transparency around antibiotic use across all animal protein sectors and we are fully engaged and support the voluntary, industry-led antibiotic use measurement efforts that are already in place. For example, the first comprehensive report on antibiotic use in poultry production was released in August 2019 followed by a peer-reviewed journal article, *Estimates of On-Farm Antimicrobial Usage in Broiler Chicken and Turkey Production in the United States, 2013-2017*¹, that captures actual use practices in the broiler and turkey industries. The report does not provide specific company data; however, the trends reported do include data from Jennie-O's farming operations within the poultry industry report. This report represents an important first step in establishing meaningful metrics for the entire turkey industry and we will continue to support efforts to collect and report data on an industry-wide basis going forward.



**PRODUCING
RAISED-WITHOUT-ANTIBIOTICS
PRODUCTS**

Hormel Foods has produced raised-without-antibiotics product offerings for many years. The company's Applegate subsidiary is the No. 1 brand in the natural and organic value-added prepared meats category. The Applegate product portfolio is produced entirely from animals raised without antibiotics. If antibiotics are given to an animal, that animal does not enter the Applegate products supply chain. When antibiotics are needed to properly care for an animal, only approved medications and dosage levels are used under the direction of a veterinarian. In addition, we offer several raised-without-antibiotics foodservice items, *Columbus*[®] products and *Jennie-O*[®] products.



METRICS

Singularly focusing on one metric, such as milligrams per pound of animal produced, can compromise the integrity of a robust stewardship program. For example, one could impact overall milligrams per pound basis by substituting a higher potency antibiotic. Dr. Randy Singer, veterinary epidemiologist, calls attention to this risk through comparing the course of treatment of penicillin and lincomycin for 12,500 turkeys weighing 25 pounds each in the following example:¹

	Penicillin	Lincomycin
Active antimicrobial per pack	1.0 billion IU/pack	192 g/pack
Gallons of water per pack ^a	666 gallons/pack	3,000 gallons/pack
Number of packs of antimicrobial ^b	27 packs	6 packs
Total IU	27,000,000,000 IU	N/A
Total active drug (g) ^c	~ 16,927.2 g	1,152 g
Active antimicrobial per bird	1,354.2 mg/bird	92.2 mg/bird
Active antimicrobial per kg body weight (BW) at time of treatment	119.4 mg/kg BW	8.1 mg/kg BW
Active antimicrobial per kg treated BW per day	17.1 mg/kg BW/day	1.2 mg/kg BW/day
Animal-Days of therapy (5 day duration of treatment)	87,500	87,500
Therapeutic regimens (number of birds treated)	12,500	12,500

^a Each antimicrobial is administered according to label instructions (U.S. Food and Drug Administration,2020a).

^b Number of packs of antimicrobial needed is rounded up, as the entire pack must be mixed into the stock solution.

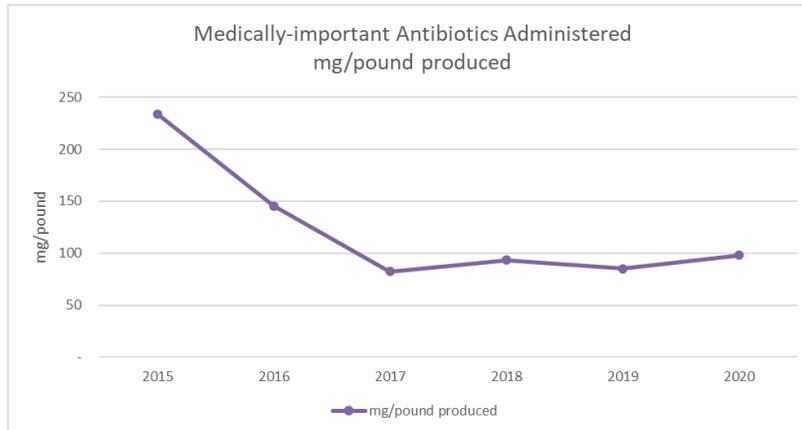
^c Conversion used for penicillin G procaine was 1,595,066 IU/g.

Even though the number of birds treated and duration of are the same in the example above, the total grams of penicillin given are 14.7 times higher than the grams of lincomycin administered due to the lower potency of penicillin.¹ What this scenario demonstrates is that a single metric, such as milligrams per pound of animal produced, is greatly impacted by the antibiotic that is chosen and that a broader commitment to overall stewardship, not just measurement, is necessary to have an impact on antimicrobial resistance.

Turkey Data

Antibiotic administration data was collected from the Jennie-O network of company and contract farms (see Graph 1). This group of farms represents more than 75 percent of Jennie-O's turkey supply. Jennie-O's farming system also produces approximately 150 million pounds of raised-without-antibiotics turkey. Any turkey flocks that received antibiotics treated are disqualified from the raised-without-antibiotics program and are included in the data below.

Graph 1: The following graph shows the medically important antibiotic use for our Jennie-O farm system from 2015 – 2020.

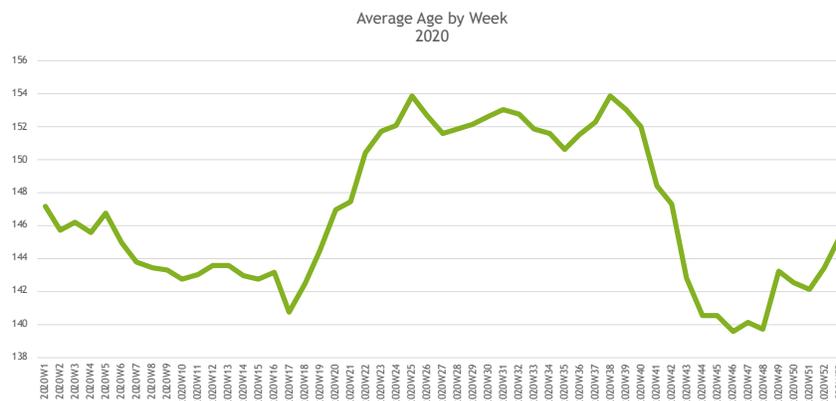


Discussion

In the last five years, Jennie-O's network of farms has reduced antibiotic use by 33 percent without sacrificing the welfare of the birds in their care. The slight increase in the most recent calendar year (2020) was driven by two primary factors: market disruptions due to COVID-19 and an outbreak of a respiratory disease in one cluster of farms.

As processing facilities had to slow or pause production due to the community impacts of COVID-19, birds were not processed at the typical time. As a result, the overall age of the birds increased (see Graph 2). The most common disease that impacts older turkeys is clostridial dermatitis, which veterinarians treat with penicillin, a low potency antibiotic. In addition, an outbreak of respiratory disease caused by *Mycoplasma gallisepticum* in one cluster of farms increased veterinary administration of tetracycline to treat the impacted birds. These factors resulted in an increased antibiotic use in 2020.

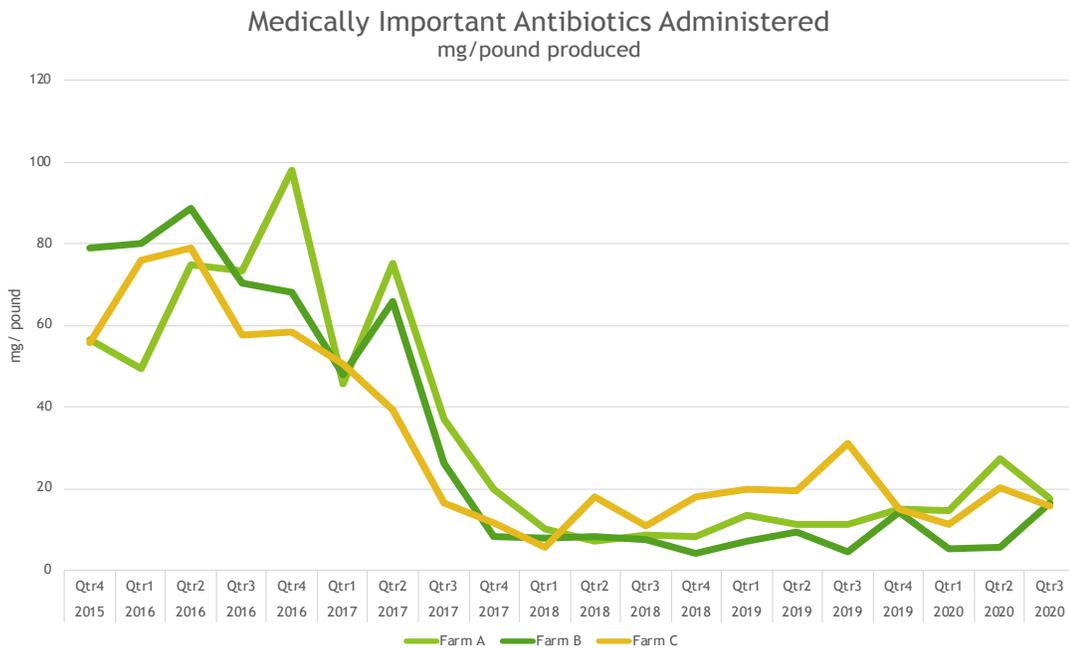
Graph 2: The following graph shows the average age of birds in Jennie-O's supply chain in 2020.



Pig Data

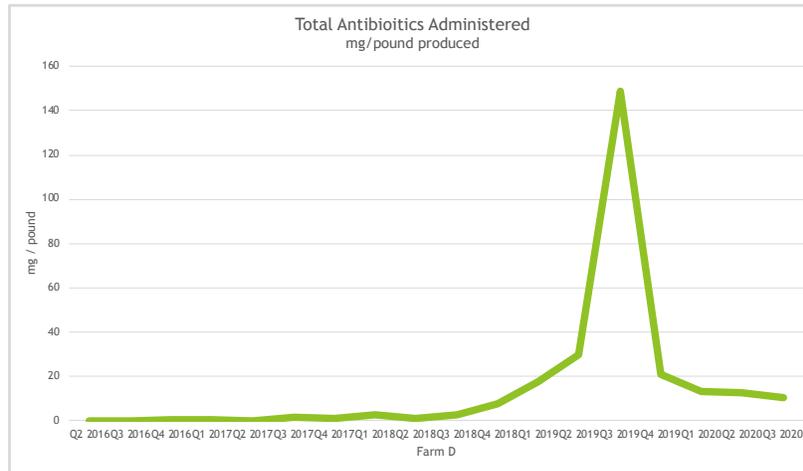
When Hormel Foods made the commitment to report antibiotics administered to the animals in our supply chain, there was very little guidance on how to best capture antibiotic use throughout the life cycle of a pig. Unlike Jennie-O, which is highly integrated, our pork supply chain relies on a large collection of producers with varying levels of integration. As Hormel Foods has one company-owned sow farm, we launched a pilot project working with farm partners from four representative systems to collect antibiotic administration data. Three of the systems support the Hormel Foods enterprise (see Graph 3), and one supports Applegate (see Graph 4). As with Jennie-O’s raised-without-antibiotics program, any hogs that are treated with antibiotics under the direction of a veterinarian do not enter Applegate’s supply chain. In total, the data in the following graphs represents approximately 660,000 market hogs. Additionally, data collected from our only company-owned sow farm is presented separately (see Table 1).

Graph 3: The following graph shows the medically important antibiotics use for three Hormel Foods hog supplier systems from 2015 – 2020.



Note: The live weight calculated was based on a 75 percent carcass yield. Pigs were cohorted based on when they started on feed so the mg/lb use for a given month is reflective of what those market hogs received.

Graph 4: The following graph shows the total antibiotics administered at a hog farm in Applegate’s supply chain from 2016 – 2020.



Note: If antibiotics are given to an animal, that animal does not enter the raised-without-antibiotics products supply chain. This chart includes the medically and non-medically important antibiotics administered.

Table 1: The following table shows the medically important antibiotics use at our only company-owned sow farm from 2017 – 2020.

	2017	2018	2019	2020
Sows mg/pound (injectable)	0.43	0.63	0.49	0.48
Sows mg/pound (feed)	33.59	20.52	66.70	88.82
Piglet mg/pound (injectable)	0.41	0.73	0.53	0.61

Discussion

The quantities of antibiotics administered captured in the pig data in this report include offspring from both porcine reproductive and respiratory syndrome (PRRS) positive and negative herds. PRRS is a viral disease very common in sow herds in the U.S. and it can impact both the sow (reproductive and respiratory effects) and the piglets (respiratory effects). We sought to make the data collected in this report as representative as possible by including PRRS positive pigs. Excluding them would have likely decreased the represented quantities of antibiotics administered but would not have been reflective of the supply chain overall.

The sporadic spikes found in Graph 3 were primarily associated with a viral challenge (such as influenza or PRRS) occurring later in life when the pigs are heavier. As most antibiotics are prescribed based on body weight, health challenges later in life have a greater impact on the quantity of antibiotics administered. It is important to understand the spikes in use do not indicate the treatment of more animals but are a result of treating older and therefore, heavier animals.

The spike in usage in 2019 reflected in Graph 4 was the result of an outbreak of dysentery in the sow herd that was introduced to the farm through gilts. It was a relatively mild strain; however, the farm experienced occasional flare-ups coinciding with other challenges such as *H. parasuis* and *E. coli*. The farm system was able to eradicate the dysentery by shifting to an all-in, all-out production system in growing and finishing. In an all-in, all-out system, animals that are grouped together stay together including at processing time. This isolates infected animals from naïve animals, allowing for eradication of some diseases over time.

The increase in in-feed antibiotic administration over the last couple of years at the company's sow far are related to a PRRS outbreak in late 2018 that was quickly followed by a porcine epidemic diarrhea virus (PEDV) outbreak in early 2019. An additional outbreak of PRRS was also experienced in 2019. Under the guidance of consulting veterinarians, we have revised our strategies to minimize the impact of PRRS, which should lead to a reduction in antibiotic administration.



CONCLUSION

As demonstrated through this report and our publicly documented efforts, Hormel Foods is committed to the transparency of its antibiotic stewardship efforts. To protect animal and human health, we must all remain vigilant stewards of antibiotics. Continual refinement of management and preventive medicine programs, engagement with veterinary experts and a commitment to continuous improvement are all critical principles of our antimicrobial stewardship program. While antimicrobial use is one metric reflected in this report, measurement as the sole index should not be the only criterion by which comprehensive stewardship programs are measured. This report not only captures antibiotic use from the various facets of our supply chain, it includes the commitment of our company to improving antibiotic stewardship through a multifaceted approach.

Please email sustainability@hormel.com if you should have any questions or feedback about this report. For more information about our corporate responsibility initiatives, including our environmental stewardship and charitable giving efforts, please visit our corporate responsibility report.

