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### **Over-The-Counter Antibiotics Moving to Prescription Antibiotics**

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The development of antimicrobial drug resistance in human medicine is a serious public health concern. For this reason, the United States Food and Drug Administration (FDA) promotes the judicious use of antimicrobial drugs in human medicine (CDC, 2021). As well as promoting the judicious use of antibiotics in human medicine, the FDA also promotes the judicious use of antibiotics in animals. The *Guidance for the Industry # 209 (GFI #209)* outlines the FDA’s thoughts on how to use antimicrobial drugs in food/animals in a judicious way. Two concepts of *GFI #209* are that antimicrobial drugs should only be used for animal health and that these drugs should be used under veterinary supervision.

Following *GFI # 209*, the FDA finalized *GFI # 213*. This guidance led to the Veterinary Feed Directive. This document stated that antimicrobial drugs used in feed or water for animals should only be used for prevention, control, and treatment of disease. This resulted in several antimicrobial drugs switching from over-the-counter (OTC) drugs (note: as the name implies, OTC drugs can be purchased without a prescription) to veterinary feed directive drugs (VFD) or prescription drugs (Rx). In keeping with the FDA’s thoughts, this required veterinary oversight.

With the implementation of the Veterinary Feed Directive in January 2017, the majority of food/animal antimicrobial drugs are now being used for prevention, control, and treatment of disease under the supervision of a veterinarian. To address the few remaining OTC food/animal antimicrobial drugs, the FDA finalized the *GFI # 263* in June of 2021. This document provided the framework for the pharmaceutical industry to voluntarily change the remaining medically important food/animal OTC antimicrobial drugs to Rx drugs. This continues the FDA’s policy of using medically important antimicrobial drugs for animal health and under the supervision of a veterinarian. This change will take effect in June of 2023.

Livestock producers need to be aware that injectable OTC antibiotics, oral forms of OTC antibiotics, and intramammary OTC antibiotics will no longer be available without a prescription from a veterinarian. Many of these products such as tetracycline, penicillin, and sulfur drugs are commonly used on farms and ranches. To obtain these products after June 2023, livestock producers will need a veterinary prescription. This will require a relationship with a veterinarian. A veterinarian-client-patient-relationship (VCPR) is defined by the Oklahoma Board of Veterinary Medical Examiners as:

- The veterinarian assumes responsibility for making medical judgments regarding the health of the animal based on a current thorough medical knowledge of the animal(s).
- Such knowledge is gained by recently seeing or being personally acquainted with the keeping and care of the animal to the extent necessary to properly make appropriate medical decisions.
- The veterinarian must keep readily accessible, written medical records of his/her knowledge and treatment of the animal with sufficient detail to clearly explain the initial exam and enable another veterinarian to take over treatment of the animal based on such records.
- The veterinarian must provide for some form of after care in case an emergency occurs after said care is provided; and the veterinarian's actions would conform to applicable federal law and regulations.

Now is the time for producers to begin to prepare for the changes in status of the OTC drugs. In preparing for the changes, a producer should have a good working relationship with their veterinarian. Producers should take an inventory of the antimicrobials that they are currently using. Producers should take that list to their veterinarian and learn what information will be needed to get a Rx for that product or products. Producers need to prepare early to avoid any interruptions in getting those products.

For livestock producers that have a relationship with a veterinarian, very little will change in June. However, for livestock producer who do not use a veterinarian, obtaining antibiotics for their animals after June 2023 will require the establishment of a VCPR. For more information about the change in status of OTC food/animal antibiotics, livestock producers should consult with their veterinarian and/or their Oklahoma State University Cooperative County Agriculture Extension Educator.

### References

CDC. Core Elements of Antibiotic Stewardship. <https://www.cdc.gov/antibiotic-use/core-elements/index.html>

Guidance for Industry # 209. <https://www.fda.gov/media/79140/download>

Guidance for Industry #263. <https://www.fda.gov/animal-veterinary/cvm-updates/fda-finalizes-guidance-bring-remaining-approved-over-counter-medically-important-antimicrobial-drugs>

Guidance for Industry # 213. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/cvm-gfi-213-new-animal-drug-combinatio-products-administered-or-medicated-feed>

VCPR. Oklahoma Board of Veterinary Medical Examiners. FAQs. <https://okvetboard.com/client-information/62-vcpr>

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### Nutrition During Gestation

*Earl H. Ward, Area Livestock Specialist*

Cow nutrition is normally focused on meeting the animal's requirement at the lowest cost possible with the overall goal of getting a live calf on the ground. It is during the gestation period that everyone is focused the cow's nutrition and then after parturition the focus is on the calf's nutrition. Should we be focused on the calf's nutrition during the gestational period? Short answer...Yes!

The nutritional plane of the gestating cow can have a positive or negative impact on the offspring's long-term performance. The influence of this excess or deficiency of nutrients during the gestational period is called "fetal programming."

During early gestation the fetal development is focused on the organs such as the kidneys and pancreas. A study at the University of Wyoming (Long et al., 2010) evaluated the growth performance of steer calves who were born to heifers that were either fed 100% of their nutrient requirement and steer calves from heifers fed 55% of their nutrient requirement during the first 83 days of gestation. The study showed no difference in birth weights, weaning weights, or average daily gains. However, the finishing phase showed a significant reduction in lung and trachea weights on the steers from heifers that were restricted in nutrition during the early stages of gestation. More research needs to be done to determine if this reduction in nutrients during early gestation has a negative effect on the offspring's ability to combat bovine respiratory disease.



It is during the mid-gestation and late gestation when muscle fiber synthesis occurs. Once a calf is born the number of muscle fibers is set and the animal will no longer make more muscle it will only increase the muscle fiber size. So, the better the nutrition during these periods could increase the number of muscle fibers an animal has and therefore increase the pounds of calves a producer could sell. Another study from the University of Wyoming (Underwood et al., 2010) looked at the performance of the steers born to cows that were either grazing native pasture (6% crude protein) or fertilized and irrigated pastures (11% crude protein) during the mid-gestation period. The results showed that steers born to cows that grazed a higher quality forage during mid-gestation had higher weights at weaning (31-pound increase), at slaughter (53-pound increase), and heavier hot carcass weights (41 pound increase) than the steer calves from the cows grazing the native pasture. In addition, the Warner-Bratzle shear force tests showed an increase in tenderness for the meat from the steers whose dams were consuming the higher quality forage. Several more studies have shown the benefit of supplementing cows an additional 1 lb of a protein supplement (42% crude protein) during late gestation with all of them showing that the steers born to cows that receiving supplement were heavier at weaning and possibly finishing weights. On the female calves, heifers born to cows that were supplemented achieved puberty at an earlier age (Funston et al., 2010) and had higher pregnancy rates (Martin et al., 2007) than heifers born to cows that did not receive any supplementation.

Taking care of cows is not an easy task, but with the rising costs of inputs producers need to really start evaluating where their money is going and where it is best spent. This article only addresses the performance aspect of keeping a cow in a positive plane of nutrition during gestation, but what about the benefits of having a healthier cow, healthier colostrum, healthier calf, or even a cow that will rebreed faster because she is in a better nutritional state? Don't cut costs by ignoring herd health and nutrition! If you would like more information, there is a great article from North Carolina State Extension (<https://content.ces.ncsu.edu/fetal-programming-cow-nutrition-and-its-effects-on-calf-performance#>) or you can contact your county's OSU Extension office.

### Literature Cited:

- Funston, R. N., D. M. Larson, and K. A. Vonnahme. 2010. Effects of Maternal Nutrition on Conceptus Growth and Offspring Performance: Implication for Beef Cattle Production. *J. Anim. Sci.* 88:E205-E215.
- Long, N. M., M. J. Prado-Cooper, C. R. Krehbiel, U. DeSilva, and R. P. Wettemann. 2010. Effects of Nutrient Restriction of Bovine Dams during Early Gestation on Postnatal Growth, Carcass and Organ Compositions, and Gene Expression in Adipose Tissue and Muscle. *J. Anim. Sci.* 88:3251–3261.
- Martin, J. L., K. A. Vonnahme, D. C. Adams, G. P. Lardy, and R. N. Funston. 2007. Effects of Dam Nutrition on Growth and Reproductive Performance of Heifer Calves. *J. Anim. Sci.* 85:841–847.
- Underwood, K. R., J. F. Tong, P. L. Price, A. J. Roberts, E. E. Grings, B. W. Hess, W. J. Means, and M. Du. 2010. Nutrition during Mid to Late Gestation affects Growth, Adipose Tissue Deposition, and Tenderness in Cross-bred Beef Steers. *Meat Sci.* 86:588–593.

# TIMELY TOPICS

OSU EXTENSION - NORTHEAST DISTRICT  
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EXTENSION

## Economic Herbicide Thresholds

*Scott Clawson, Area Ag Economics Specialist*

The recent weather has offered us a reprieve from the winter cold and reminded us of the spring we have waiting around the corner. Drought conditions left many of our pastures in difficult shape. Pastures grazed tight lead to an open canopy. This creates an environment allowing weeds to take hold in our pastures. From an economic perspective, is there a threshold that makes a herbicide application a good economic decision? Yes, but like many other things, that threshold will be different amongst operations and situations. There are certainly other pieces of the puzzle to consider in herbicide applications, this article will just approach it from an economic perspective.

### Creating a threshold

We can start with a sample situation. We have a pasture with approximately 30% weed coverage, 2,000 pounds of expected production, and it will cost \$20/acre for herbicide and application. We will get 90% efficacy with our herbicide.

**RULES OF THUMB**  
An average acre of land produces 1 ton (2,000 lbs.) of forage per year.  
One pound of weeds killed will return roughly one pound of forage in replacement.


Sample calculation:

Production: 2,000 pounds	X	30% weed coverage	=	600 pounds of weeds per acre
600 pounds of weeds	X	90% herbicide efficacy	=	540 pounds of grass replaced
\$20 per acre herbicide cost	/	540 pounds of grass	=	<b>\$0.037 per pound or \$74.07 per ton</b>

We can use this final number in the calculation to reference our ability to source forage on the open market. Hay prices are an easy and logical way to reference forage values. For example, we will use \$100/ton or \$.05/lb. for our current forage value. This would be an average grass hay price in many years. This would mean that the cost of forage created from the herbicide application (\$74.07/ton) is cheaper than the forage on the open market (\$100/ton). In this situation, it would be a good economic decision to spray.

Knowing how the thresholds change is just as important as the base calculation. All the variables impact the threshold. For example, if we are fertilizing our better ground and expecting 4,000 + lbs. per acre, the threshold of weeds we are willing to accept drops significantly. Also, in years where inputs (herbicide, fuel, etc.) may be high, but forage values are low we could tolerate having some weed pressure in our more marginal production areas.

As we fine tune our profitability or navigate with narrow margins, find ways to evaluate and quantify our management decisions. This is just one avenue moving into 2023 where we can dial in our cash expenses. Current feeder cattle futures contracts are signaling higher cattle prices this year, but there are also expectations for continued higher input costs. Balancing these two price issues can pay dividends. For more assistance, contact your local OSU Extension Ag Educator.

		 <b>Value of Gain Calculation</b>				
EXTENSION						
OK Weighted Average Report 1/6/23						
Weight	\$/lb	Value/hd	Added lb.	Added \$	\$/lb Added	
376	\$ 2.4892	\$ 935.94				
428	\$ 2.5072	\$ 1,073.08	52	\$ 137.14	\$ 2.64	
478	\$ 2.3318	\$ 1,114.60	50	\$ 41.52	\$ 0.83	
525	\$ 2.2182	\$ 1,164.56	47	\$ 49.95	\$ 1.06	
576	\$ 2.1161	\$ 1,218.87	51	\$ 54.32	\$ 1.07	
621	\$ 1.9753	\$ 1,226.66	45	\$ 7.79	\$ 0.17	
671	\$ 1.8925	\$ 1,269.87	50	\$ 43.21	\$ 0.86	
724	\$ 1.8509	\$ 1,340.05	53	\$ 70.18	\$ 1.32	
772	\$ 1.8174	\$ 1,403.03	48	\$ 62.98	\$ 1.31	
817	\$ 1.8020	\$ 1,472.23	45	\$ 69.20	\$ 1.54	
867	\$ 1.7890	\$ 1,551.06	50	\$ 78.83	\$ 1.58	
<b>Long Stocker Run</b>		<b>Short Stocker Run</b>		<b>Heavy Stocker Run</b>		
<i>Starting</i>		<i>Starting</i>		<i>Starting</i>		
376	\$ 935.94	376	\$ 935.94	671	\$ 1,269.87	
<i>Ending</i>		<i>Ending</i>		<i>Ending</i>		
867	\$ 1,551.06	576	\$ 1,218.87	867	\$ 1,551.06	
<i>Total Gain</i>		<i>Total Gain</i>		<i>Total Gain</i>		
491	\$ 615.12	200	\$ 282.93	196	\$ 281.20	
<i>VOG</i>		<i>VOG</i>		<i>VOG</i>		
\$ 1.25		\$ 1.41		\$ 1.43		



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