Perspectives of the history and development of metaphylactic treatment with antibiotics and how I implement today

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Abstract

Of all the diseases and health problems that newly arrived cattle in a feedyard face, by far the bovine respiratory disease (BRD) complex is the most common and most costly. There are many approaches to preventing and treating respiratory disease in new cattle, including vaccines, feed additives, feeding programs, and low-stress handling. Many of the new cattle have been stressed by weaning, hauling long distances, commingling, and stressful handling. Thus, in these cattle there may be a need for antibiotic therapy on arrival or soon after arrival, a practice called metaphylactic treatment with antibiotics.

Key words: BRD, stress, metaphylactic antibiotic treatment, metaphylaxis

Résumé

Parmi toutes les maladies et les problèmes de santé auxquels les nouveaux bovins sont confrontés dans un parc d'engraissement, le complexe respiratoire bovin est de loin le plus fréquent et le plus onéreux. Il existe plusieurs approches pour gérer la maladie respiratoire chez ces nouveaux bovins : les vaccins, les suppléments alimentaires et le traitement peu stressant. Plusieurs de ces nouveaux bovins ont été stressés par le sevrage, le transport sur de longues distances, le rassemblement et le traitement. Par conséquent, ces bovins pourraient nécessiter une thérapie antibiotique à l'arrivée ou peu après, une pratique que l'on appelle le traitement antibiotique en métaphylaxie.

Introduction

Since the beginning of the cattle industry as we know it, cattle have been weaned, driven or hauled and commingled. The bovine respiratory disease (BRD) complex was, and is, a result of these stresses. Most attempts at treating BRD were unsuccessful until the advent of sulfa drugs and penicillin. These products were very effective if the cattle were treated early in the respiratory disease cycle. Then as now, treating after the disease progressed to severe lung damage was unsuccessful.

I was introduced to production medicine (herd health) from my experience with our cattle, swine, and sheep operations. In the late 1960s when I graduated from veterinary school, not much mass treatment with antibiotics was practiced in our area. Soon after that as we became more involved in a herd health approach with our clients, we quickly saw the value of mass treating certain loads of new cattle or cattle breaking with respiratory disease with an antibiotic.

My Perspective and Experience with History of Metaphylactic Treatment with Antibiotics

Some of the early mass treatment programs were:

- IV treatment with oxytetracycline (50 mg) in loads of cattle breaking with BRD. This was very time-consuming, but very effective. One single IV dose seemed to be very efficacious.
- Mass treatment with penicillin G or a long-lasting penicillin product. This approach was much faster; again, this was used mainly in loads breaking with BRD.

You always had epinephrine with you as a reaction was common, especially in Mexican cattle.

- Sulfathiazole in the water–while not an antibiotic this practice seemed to be very effective in new cattle and in treating respiratory breaks. we developed a fairly elaborate system to deliver this to the water systems in many of the operations.
- AS 700[a] and Aureomycin[b] was used for mass treating many diseases including pinkeye, foot rot, anaplasmosis, and BRD. These products still remain available with a VFD.
- Erythromycin. This practice did not last long because of the tissue reaction at the injection site, often in top butt area.

In the late 70s we saw a drastic change in the approach to mass treating cattle. As I look back now it was not pretty. I will call these the "dark years" of metaphylactic antibiotic therapy. Some of the practices were:

- Mixing products or compounding, often 2 different antibiotics and a vitamin.
- Aminoglycosides, in particular gentamicin and neomycin. These 2 products were used on a large scale

because of cost and apparent effectiveness. Cattle were often mass treated 2 or 3 days in a row.

- Chloramphenicol - this product appeared to be quite effective, but we soon saw human health consequences in those using this product.
- Lincomycin
- Spectinomycin products

This continued on a large scale throughout the 70s and 80s. These products were cheap and easy for producers to obtain.

Five things changed the picture in the late 80s and 90s.

1. Ceftiofur[c] was introduced in 1988. This drug was low-dose, easy to administer, and effective. I did not see much metaphylactic use of ceftiofur until the introduction of ceftiofur crystalline free acid.[d]
2. Tilmicosin was introduced in 1992. At the time it was used as an individual animal treatment drug, but soon after we saw the value as a metaphylactic treatment antibiotic.
3. Post-treatment interval (PTI) - this concept changed the management of riding new cattle after individual treatment as well as cattle mass treated.
4. Academy of Veterinary Consultants resolution on aminoglycoside use in food animals. The respected organization took a position against using these drugs extra-label.
5. Realization of tissue residue issues with aminoglycosides.

Today, in my mind in the feedlots and in progressive stocker operations, metaphylactic treatment with antibiotics is carried out according to FDA guidelines on labeled use, withdrawal times, and route of administration.

How I Implement Metaphylactic Treatment with Antibiotics Today

When I develop treatment and processing protocols, I always try to remember these 4 guiding principles:

1. Our cattle procurement system often is not health-friendly; in fact, it is just the opposite.
2. Don't mess up adrenal gland health.
3. Don't mess up gut health.
4. In newly received stressed cattle in a feedlot or stocker operation, the one thing that comes in a bottle that actually positively influences arrival health is an antibiotic.

Factors that I consider when developing a metaphylactic treatment with antibiotic protocol:

- history of cattle
- condition on arrival
- weather and season
- number of cattle being received at this time
- age and weight
- hospital pen space
- break-even estimates
- labor situation
- owner's preference and philosophy on antibiotic use
- necropsy or diagnostic test results.

Conclusion

Metaphylactic treatment with antibiotics remains an effective and economical approach to aid in the prevention and treatment of BRD. Now, more than ever, it is critical that we carefully evaluate the need for metaphylaxis in individual loads of cattle. This discretion will result in a more effective and economical use of this valued tool. We must recognize the value of this program as a tool, and not a crutch.

Endnotes

[a] AUERO S 700, Zoetis, Parsippany, NJ
[b] Aureomycin, Zoetis, Parsippany, NJ
[c] Naxcel, Zoetis, Parsippany, NJ
[d] Excede, Zoetis, Parsippany, NJ