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REVIEW ARTICLE

Role of Antibiotic in Ruminant: Review

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ABSTRACT

The aim of this study was evaluate of Antibiotics in Ruminant Animals. There have been developing controversies surrounding the use of antibiotics as growth promoters for food animals. These components are used at low doses in animal feeds and are investigated to improve the quality of the product, by a lower percentage of fat and higher protein content in the meat. Other advances of the use of antibiotic growth-promoters include control of zoonotic pathogens such as Salmonella, Escherichia coli and enterococci. Antibiotic growth promoters enhance the efficiency of nutrient utilization, improving retention of Nitrogen and Phosphor and decreasing excretion when nutrient intake matches requirements, therefore, Use of any antibiotic is related by the selection of resistance in pathogenic bacteria and it has been argued that the use of antibiotic growth-promoters imposes a selection pressure for bacteria that are resistant to antibiotics that may be used in clinical or veterinary practice, therefore compromising the continued use of antimicrobial chemotherapy. This paper studies the use of antibiotics as growth promoters and then examines some of the alternative methods for achieving meat of high quality.

Key Words: *Antibiotics, Performance. Ruminant.*

INTRODUCTION

The supply of food needed to adequately meet human nutritional needs over the next 40 years is quantitatively equal to the amount previously produced throughout the entire history of Human kind (Bauman, 1992). Thus, most of the world's population resides in developing countries, which are experiencing the most rapid growth rates, global demand for meat is Projected to enhance more than 60% of current consumption with the year 2020 (Cast, 1999).

To meet the challenge of world food needs, animal scientists must develop new technologies to increase productive efficiency, produce leaner animals, and provide increased economic return on investment to the producer (NRC, 1994).

Antibiotics are added to animal feeds to treat and prevent infections and to improve growth and production. Recently, the major concerns about incorporation of antibiotics in animal feeds associated to antibiotic residues in products from treated animals. Growth-promoting antibiotics are products that are incorporated into animal feed to create favorable conditions in the animal's intestine for the digestion of food. They are used to improve feed conversion capability and hence growth rates of the animal without laying down excessive amounts of fat.

Growth-promoting antibiotics are authorized under stringent European legislation requiring independent expert scrutiny. Antibiotics licensed as growth promoting antibiotics have been particularly selected to remain in the gut, not to pass into the animal's body, and particularly chosen as compounds not used as human or veterinary therapy. Nevertheless, this class of products is being withdrawn in Europe, than the use of growth promoting antibiotics is being phased out by the start of 2006. Although, the term "antibiotic growth promoter" is used to describe any medicine this destroys or inhibits bacteria and is administered at a low, sub therapeutic dose. Utilize of antibiotics for growth promotion has arisen by the intensification of animals farming. Infectious agents reduce the efficiency of farmed food livestock and, to control these, the administration of sub-therapeutic antibiotics and antimicrobial agents has been shown to be effective. Utilize of growth-promoters is mainly a problem of intensive farming methods and the problems caused with their use are mainly those of developed rather than developing countries.

Antibiotic growth promoters are utilized to "help growing livestock digest their food more efficiently, get maximum benefit from it and allow them to develop into strong and healthy individuals". Although the mechanism underpinning their action is unclear, it's concept which the antibiotics suppress sensitive populations of bacteria in the intestines. It has been evaluated which as much as 6% of the net energy in the livestock diet could be lost due to microbial fermentation in the intestine. If the microbial population could be better controlled, it is possible that the lost energy could be diverted to growth.
This research considered a descriptive and qualitative assessment of published information of investigates undertaken to study the effects of antibiotics growth promoting use on performance and health of ruminant.

USE OF ANTIBIOTIC IN ANIMALS FEED

Antibiotics have been utilized in animal feed for 50 years ever since the discovery not only as an anti-microbial, but as a growth-promoting agent and improvement in performance. Penicillin, streptomycin and bacitracin soon began to be common additives in feed for animals. Usually, the following antibiotics are used in animals feed: procaine penicillin, streptomycin, erythromycin and virginamycin. In addition to these antibiotics that are of microbial origin there are other chemically synthesized antimicrobial agents that are sometimes used in livestock feeds. These include three main classes of compounds: arsenical and sulfa compounds. Other chemicals are also used as antiprotozoal agents to prevent coccidiosis and histomaniasis in poultry. Antibiotics are used regularly in livestock feed at a rate of 2-50 grams per ton for improved performance in the livestock. The reasons include a more utilize conversion of feed to livestock products, an increased growth rate and a lower morbidity/mortality rate in general. The levels of antibiotics are common increased to 50-200 grams/ton or more when particular diseases are being targeted as when the spread of a particular disease is rampant. The levels are increased in times of stress. This increased amount is often decreased when the threat of a disease is gone.

GROWTH PROMETERS

Antibiotics utilized for growth-promoting purposes constitute a large proportion of the total antibiotic usage, but the index of the problem is difficult to evaluate since there is small published information on the overall quantities of antibiotics utilized in livestock. Prescott (1997) showed that 40% of antibiotic production in the USA was for utilize in stock feeds, including 55± 60% of penicillin G and tetracycline production.
European of Animal Health (EFAH, 1998) suggested that a 2-month survey in Europe had reported that of 10 493 t antibiotic, 52% was for medical use, 33% for veterinary use and 15% for growth-promotant use. Unfortunately, the dentitions of veterinary and growth-promotant use were not given.

MODE OF ACTION OF GROWTH-PROMOTANT ANTIBIOTIC

The mode of action of antibiotic growth promoting isn't known. Most of the growth promotants are active against Gram positive organisms. Although, the concentrations used are lower than therapeutic levels, although they may exceed the minimal inhibitory concentration for the Gram-positive intestinal bacteria. The agents are assumed to exert their effect with acting on the intestinal Gram negative organisms to cause a range of beneficial changes: causing lethal or sub lethal damage to pathogens; causing a reduction in the production of bacterial toxins; reducing bacterial utilization of mandatory nutrients; allowing increased synthesis of vitamins and other growth agent; improving the absorption of nutrients with reducing the thickness of the intestinal epithelium; reducing intestinal mucosa epithelial cell turnover and reducing intestinal motility. It considers that the addition of growth promotants to feed diet changes intestinal characteristics so which they more closely resemble those seen in germ-free livestock. It's clear which, in many cases, the effects are more noticeable in sick animals and animals housed under conditions of poor hygiene (Prescott & Baggot 1993). There are also age-associated effects, with younger livestock showing a greater response to growth promotants than older livestock.

BENEFITS OF ANTIBIOTIC USE IN LIVESTOCK FEED

The advance of antibiotics in livestock feed include increasing utilization and growth rate, treating clinically sick livestock and preventing or reducing the incidence of infectious disease. By far the main utilize of antibiotics among these, thus, is increased efficiency. More efficient conversion of feed to livestock products, and an improved growth rate. Penicillin and Chloro tetracycline also show an improved growth rate, but low effect on mortality. Antibiotics in livestock feed, in general, are used regularly for increased efficiency and growth rate than to combat particular diseases.

RISK OF ANTIBIOTIC IN LIVESTOCK FEED

After livestock have been fed antibiotics over a period of time, they diet the strains of bacteria that are resistant to antibiotics. These bacteria proliferate in the livestock. Through interaction, the resistant bacteria are transmitted to the other livestock, therefore forming a colonization of antibiotic resistant bacteria. The bacteria flourish in the intestinal flora of the livestock, likewise, in the muscle. Thus, the feces of the animal common contain the resistant bacteria. Transfer of the bacteria from livestock to human is possible through many practices. The primary exposure of humans to resistant bacteria occurs in farms and slaughterhouses. Humans clean the feces, which contain the bacteria, of the livestock on farms. During the cleaning process, humans may get bacteria on their body and hands. If the body or hands are not properly cleaned, the bacteria could be ingested with the person. Likewise, in slaughterhouses, during slaughter, the intestine is severed. Resistant bacteria are exposed to slaughterhouse workers, which could get the bacteria on their bodies and hands. Transmission occurs when the bacteria is ingested. Along by the previous sources of contamination, humans can get infected with eating meat from livestock with resistant bacteria. Even though cooking reduces the survival of the bacteria, some may still survive and infect the human. After initial transmission and infection to humans, the transmission to other humans has a couple paths. Transmission can take place through the many of human contact in the community. An infected individual may also be admitted to a hospital for treatment. Treatment may not work in drug resistant bacteria, therefore, identifying a drug resistant infection. Bacteria are transmitted to other patients via the hospital environment or health care workers hands. After transmission, the bacteria will colonize in several of the patients. Colonization in other patients by other resistant bacteria can produce bacteria by multi-drug resistance. Once the patients recover, they are discharged into the community. These patients could potentially infect several community members. Multiple infections could potentially produce a supergerm that is resistant to many drugs due to resistance sharing between bacteria.

ECONOMIC IMPACT

The economic impact is difficult to measure, slightly because extensive searching couldn't turn up exact figures for employees and profits particularly in feed additives. Although, it's safe to say that in the U.S. alone, stopping the practice of adding antibiotics would result in a loss of millions of dollars in profits and thousands of lost jobs. It's worth noting that index of antibiotics are profitable sector for companies that engage in their productions.

CONLUSION

The utilize of growth-promoting antibiotics has more advance than just the production of quality meat and milk. It has positive benefits to the world we live in. Their use leads to:

- Less feed required for livestock production.
- Reduced levels of N and P, CH_4 and NH_3 entering the environment.
- Less water consumption.
- Dramatic reductions in manure production.
- Reduced requirement for fossil fuels for the transportation of feed and manure.
- Less land needed.

There is believed which the phase-out and the trend to replace these products with substances and systems that haven't been subjected to the same independent scrutiny could cause problems in years to come.

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I was appreciating my wife because she is helping me always.

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