

Antibiotics as a Feed Additive for Animals

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Abstract

For sustainable livestock farming, better utilization of feed ingredients in animal ration is essential. Different feed additives play an important role in better digestion, absorption, and utilization of nutrients in the animal body. One of the feed additives used in the animal ration is antibiotic feed additive. An antibiotic is a biological origin chemical substance produced by living microbes, which can inhibit the growth of pathogenic organisms in animal body. Antibiotic acts in different ways in animal body and enhance the animal performance in the form of improvement in growth rate, improves feed intake and feed efficiency, reduces incidences of diarrhea, prevents stress during extreme environmental conditions and preventing bloat in animals. These antibiotic feed additives are useful during stressful conditions like transporting, crowding of animals, poor management conditions, during early age development, especially in monogastric animals.

Keywords: Animals, Antibiotics, Feed additives, Growth

Introduction

An antibiotic is an anti-pathological substance of biological origin produced by living microbes. These chemical substances can inhibit the growth of pathogens, undesirable organisms, mainly bacteria.

Mode of action of antibiotics

1. Inhibits the growth of pathogens that compete for nutrients with the host animal.
2. Enhance the intestinal absorption capacity, rate of nutrient absorption by reducing the thickness of the intestinal wall.
3. Depress the competition for nutrients between host and internal parasites.
4. It supports the synthesis of the vitamins in the intestine.
5. It supports the growth of microbes that synthesizes unidentified or animal protein factors.

6. It reduces the urease activity, hence ammonia produced, which is harmful to non-ruminants, monogastric species and suppresses the growth.
7. It prevents the production of harmful toxins amines bacterial metabolites e.g. putrescine and cadaverine in caecum.
8. It helps to keep animals free from sub-clinical infections.
9. Antibiotics have glucose sparing effect due to the prevention of lactic acid production.
10. It helps in the movement of cations (Ca, Na, and K) across the cell membrane.
11. Inhibits the lactic acid production and bio-hydrogenation of fatty acids in the rumen.
12. Stimulate the cellular metabolism, alter metabolic activity and favours rumen environment.
13. Helps to protect the proteins in the rumen.
14. Helps to maintain rumen pH normal.
15. Prevent the loss of micronutrients, CH₄ production, tympany adsorption of harmful agrochemicals (insecticide residues).

Effect of antibiotics feeding

1. Increase the growth rate by 10 to 20% in young ones (calves, kids, lambs, chicks) up to 6 weeks and piglets up to 50 Kg body weight.
2. Improve the feed intake and feed efficiency by 5 to 8 %.
3. Prevents the incidences of diarrhea in young calves and piglets.

Effect of antibiotic feeding is more significant during:

1. Stress period due to extreme environmental conditions, transport, crowding, mining, physical etc.
2. Feeding low protein and low quality protein.
3. Poor manage mental condition.
4. Early developmental age.
5. In monogastric species.
6. Diet deficit in protein, minerals and vitamins.

Warning:

1. Feeding of antibiotics is no a substitute for good management or balanced feeding.
2. In pigs-feeding two or more antibiotics at a time has no additional advantage over single feeding.

3. In poultry, penicillin is more effective than others.

Precautions while feeding antibiotics

1. Should not be used for adult ruminants, breeding pigs, breeding and laying birds and meat-producing animals.
2. It is to be used during growing, stress and infectious period.
3. It must be premixed before mixing in compound feeds.

Limitations of antibiotics feeding

1. It will not modify the normal development and functions of rumen or microbial populations.
2. In meat-producing animals, high doses accumulate in meat and create health hazards to meat consumers.
3. It has no effect in adult ruminants on milk production and composition.
4. It affects cellulolytic bacteria's activity and adversely the cellulose digestion.
5. Constant use leads to the development of resistant strains of bacteria.
6. At a low concentration i) they favours the development of resistant strains against the organisms, ii) they are not beneficial to prevent mastitis, foot rot or infectious diseases in dairy animals.

Conclusion

It is concluded that antibiotics plays an important role in improving animal growth and performance, but their judicious use is necessary.

References

- Chattopadhyay, M. K. (2014). Use of antibiotics as feed additives: a burning question. *Frontiers in Microbiology* 5. DOI=10.3389/fmicb.2014.00334.
- Muurinen, J., Richert, J., Wickware, C.L. *et al.*(2021). Swine growth promotion with antibiotics or alternatives can increase antibiotic resistance gene mobility potential. *Science Reporter*, 11, 5485 (2021). <https://doi.org/10.1038/s41598-021-84759-9>.
- Wegener, H. C., Aarestrup, F. M., Jensen, L. B., Hammerum, A. M., & Bager, F. (1999). Use of Antimicrobial Growth Promoters in Food Animals and Enterococcus faecium Resistance to Therapeutic Antimicrobial Drugs in Europe. *Emerging Infectious Diseases*, 5(3), 329-335. <https://doi.org/10.3201/eid0503.990303>.