



# **GROWTH PROMOTER**

# growth promoters

- To increase growth rates and improve overall efficiency and product quality. Various compounds have been tried for growth promotion, including hormones and antimicrobial agents. Natural hormones such as estradiol (estrogen), progesterone and testosterone or synthetic hormones such as zeranol and trenbolone acetate are widely used as growth promoters in animals. The nontherapeutic use of wide spectrum of antimicrobial agents including ionophores is a common practice in improving animal production.



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- Due to the various risks of antimicrobial agents and hormones, new alternative additives were suggested which may include microbial cultures (probiotics) that are now used in ruminants to manipulate certain biochemical events and the microbial composition of the rumen and prebiotic molecules such as oligosaccharides and lectins. Pre- and probiotics do not exclude each other's function and can or must be used simultaneously in order to obtain a powerful synergistic effects.

# growth promoters

- **First : Hormones**
- Hormones have been developed for a number of purposes, including treatment of hormonal disorders in people, and also for promotion of unnaturally fast growth in farm animals.
- The natural hormones estradiol (estrogen), progesterone and testosterone and their synthetic alternatives zeranol and trenbolone acetate .

## Mode of action of growth promoting hormones is to:

- 1) help to improve meat quality by decreasing the deposition of fat, producing the lean meat that consumers desire;
- 2) increase feed efficiency, thereby allowing more growth with less feed;
- 3) increase lactation period in cows when injected with bovine growth hormone (rBGH). This hormone interacts with other hormones in cows' bodies to increase the amount of milk they produce.
- 4) Growth promoting hormones enhance estrogen production and growth.

## **Risk of using growth promoting hormones:**

- The use of hormones such as steroid hormones, beta-agonists and somatotropins as growth promoters because their use may result in animal health and welfare risks. The adverse effects include developmental, neurobiological, genotoxic and carcinogenic effects .

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- **Second : Antimicrobial Agents**
- The term “antimicrobial growth promoter” is used to describe any medicine that destroys or inhibits microbes and is administered at a low, sub therapeutic dose. The use of antimicrobial for growth promotion has arisen with the intensification of livestock farming. Infectious agents reduce the yield of farmed food animals and, to control these, the administration of sub-therapeutic antibiotics and antimicrobial agents has been shown to be effective.

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- The non-therapeutic use of antibiotics has the following aims:

prophylactic purposes in young animals, to reduce the enteric diseases whose onset is favoured by incomplete development of the immune system during the first weeks of life; and in adult animals, to prevent the onset of feed-induced pathologies.



## Risks of antimicrobial growth promoters:

- there is controversy surrounding the use of growth promoters for animals destined for meat production, as overuse of any antibiotic over a period of time may lead to the local bacterial populations becoming resistant to the antibiotic. This is not an invariable rule: *Streptococcus pyogenes* remains sensitive to penicillins after over sixty years of clinical use but such examples are, however, very rare.

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- **Third: Probiotics as Growth Promoters**

- Probiotics are live microorganisms capable of inducing a beneficial effect on the balance of microorganisms in the digestive tract “indigestible dietary ingredients which positively affect the host by beneficially and selectively stimulating the growth and/or activity of a limited number of bacteria”. Prebiotics act by stimulating the microorganisms which are present in the intestinal tract and not by integrating them, as is the case for probiotics. Pre- and probiotics do not exclude each other’s function and can or must be used simultaneously in order to obtain a powerful synergistic effect .

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- Probiotics are now used in ruminants to manipulate certain biochemical events and the microbial composition of the rumen. It was found that feeding steers with rations added with cells from *S. cerevisiae* reduces the production of lactate and stabilizes the pH. This is may be due to a stimulating action on the bacteria which use lactic acid, e.g. *Selenomonas ruminantium* or *Megasphaera elsdenii* . It was also found that stabilization of ruminal pH improves production performance by stimulating *S. ruminantium* . An increase in the use of lactate in *S. ruminantium* can be obtained by using products based on *Aspergillus oryzae*.

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- **Fourth: Chemical Probiosis**
- Several molecules may play a pre-biotic role without using the energy and protein sources in the same fashion as microorganism and have different needs for micronutrients and vitamins compared with microorganisms. These molecules include fructo-oligosaccharides(FOS), gluco-oligosaccharides (GOS), galacto-oligosaccharides (GAS) and xylo-oligosaccharides (XOS).



**Thank you for listening**