Innokit supplementation in Commercial Broilers for growth promotion

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INTRODUCTION

The term "antibiotic growth promoter" is used to describe any medicine that destroys or inhibits bacteria and is administered at a low, sub-therapeutic dose. The use of antibiotics 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. The use of growth-promoters is largely a problem of intensive farming methods and the problems caused by their use are largely those of developed rather than developing countries.

Thomke & Elwinger (1998) hypothesize that cytokines released during the immune response may also stimulate the release of catabolic hormones, which would reduce muscle mass. Therefore a reduction in gastrointestinal infections would result in the subsequent increase in muscle weight. Whatever the mechanism of action, the result of the use of growth promoters is an improvement in daily growth rates between 1 and 10 per cent resulting in meat of a better quality, with less fat and increased protein content.

Aims of Using AGP

There are three purposes in the supplementation of AGPs in feeds.

Firstly, AGPs decrease the susceptibility of animals to infectious pathogenic microorganisms, reduce disease incidence and improve animal health status.

Secondly, AGPs promote growth and improve feed efficiency. The effectiveness of AGP in improving feed efficiency and animal performance has been widely accepted.

Thirdly, AGPs meet other special requirements in practice, including improving general appearance, anti-stress capability, bettering egg color, and so on.

About Kitasamycin:

Kitasamycin was developed by Japanese Kitasa Institute. The antibiotic was produced by Streptomycin kitasatoensis with the active compound of 16 carbon
macrolide. The antibiotic has other names such as Selectomycin, leucomycin, ayzermicina, sineptin. This antibiotic was approved by Ministry of Agriculture in 2001 as the growth promoter additive in poultry and swine to control and prevent digestive and respiratory diseases.

Chemical and physical properties of Kitasamycin

**Active components**

Kitasamycin is a macrolide antibiotic. There are several active components such as A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4. Among these components, B1, B2, B3 and B4 have almost half of that much of activities of A’s and with higher toxicities. A1, B1, B3, B4 are white crystals. A3, A4, A5, A8 and A9 are white pillar shape crystals. A7 is white needle shape crystal. All of the active components are basic, some are soluble in organic solution, almost not soluble in water (less than 0.1%). The melting point is 125 – 137 degree C.

**Stability**

Kitasamycin is stable in neutral and weak basic condition. Its activity declines when it is the condition of pH more than 5.5.

**Pharmacological Characteristic**

Belonging to the macrolide antibiotic, its antibacterial activity is similar to tylosin, erythromycin, spiramycin and oleandomycin. The mode of action is to inhibit the protein synthesis process. Its inhibition spectrum includes Mycoplasmas, Gram-positive bacteria, Gram-negative bacteria, Leptospira, Rickettsia. It also inhibits most bacteria resistant to penicillin, oxytetracycline, chlorotetracycline, erythromycin and chloramphenicol bacteria strains. It is a safe and high efficacious growth-promoting additive for poultry and swine.

**Antibiotic spectrum**

Similar to that of erythromycin, but kitasamycin is sensitive to Staphylococcus aureus strains that are resistant to erythromycin.

Kitasamycin is sensitive to bacterial strains that are resistant to penicillin. There are reports that 72% penicillin resistant Staphylococcus are sensitive to kitasamycin. Mycoplasma gallisepticum, Mycoplasma granularum, Clostridium perfringens, swine mycoplasma, Siprochaeta ichterobaemorrhagiae and Richettsia. Kitasamycin is also sensitive to Streptococcus suis, Corynebacterium pyogenes, Streptococcus pneumoniae, Streptococcus pyogenes, Corynebacterium diphtheria, Haemophilusparagellinarum, Actinobacillus pleuropneumonia, Campybaccheri coli.

Indian Trial report

**Material and Method:**

Birds: Commercial broilers, mixed sexes (50%), reared from day old to 42 days old.

Trail facility: Commercial broiler house, standard open sided house with concrete floor, 2 floor pens, with trough feeders and bell drinkers and isolated roof. Saw dust litter will be used.

Ambient temperature: Max: 32 degree Celcius, Min: 216 degree Celcius
Humidity: 40-55% ranging from day to night

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Design: Randomized Floor pen study, 2 treatments of 5000 birds (2500 birds per pen).

T1- Bactracin Methyl Disalicylate (BMD) @ 400 grams per ton of feed from day old to culling
T2- Innokit (kitasamycin 20%) @ 100 grams per ton of feed from day old to culling

Feed: Standard corn and soybean based ration formulated for two stages: Starter (S) 0-21 days; Finisher (F) 22 – 42 days. No withdrawal feed.

Measurements:
- Live Weight and DWG at 14d, 21d, 42 d
- FCR 14d, 21d, 42 d
- Mortality daily

Results and Discussion:
The results are showing (see Table) that INNOKIT has improved body weight, feed conversion and reduced mortality.

<table>
<thead>
<tr>
<th>DAYS</th>
<th>21</th>
<th>28</th>
<th>42</th>
<th>21</th>
<th>28</th>
<th>42</th>
<th>Diff. at culling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Weight in grams</td>
<td>877</td>
<td>1149</td>
<td>2074</td>
<td>823</td>
<td>1120</td>
<td>1995</td>
<td>79</td>
</tr>
<tr>
<td>FCR</td>
<td>1.32</td>
<td>1.54</td>
<td>1.79</td>
<td>1.29</td>
<td>1.58</td>
<td>1.84</td>
<td>-0.05</td>
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<tr>
<td>Mortality%</td>
<td>3.2</td>
<td>3.9</td>
<td>4.6</td>
<td>2.7</td>
<td>3.5</td>
<td>5.4</td>
<td>-0.8</td>
</tr>
</tbody>
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Conclusion:
Innokit (kitasamycin 20%) feed supplement, antibiotic growth promoter, a research product from Japanese Kitasa University, has proven to offer beneficial effects on boiler performance in terms of better growth and FCR and reduced mortalities over other widely used AGPs. There is an improvement of 79 grams in body weights, 5 points improvement in feed conversion and 0.8% less mortality in the treated group as compared to the BMD group on the day of slaughter at 42 days.
Frequently Asked Questions:

1.Q: How effective is Kitasamycin against treating respiratory and digestive diseases?

i) The respiratory infections of chickens is mainly caused by mycoplasma and G+ bacteria. Mycoplasma is usually the inductive pathogen for respiratory disease.

ii) The microbial population in digestive canal of livestock includes G- (eg. E coli) and parts of G+(eg. Clostridium), when microbial population becomes unbalanced, it leads to loose droppings caused by Bacillus coli or enteric inflammation resulted from Gram+.

iii) Kitasamycin has antibacterial activity to mycoplasma, Gram+, some Gram-, and it is hypersensitive to mycoplasma and C. perfringens at ircumnatal period. The action mechanism is to inhibit the protein synthesis of bacteria so that bacteria cannot grow. If Kitasamycin is orally taken, target anaimal will absorb it well and comes peak of content in blood after 2 hours. Kitasamycin focus and concentrate at Live and lung, excrete from liver and gall system. As a result, it has fairly good precaution and controlling effect to respiratory infection and enteritis of chickens.

2.Q: At what stage of Mycoplasma infection is Kitasamycin most effective?

A Sub Clinical Mycoplasma infections: During this period, to use the growth promotion (medicated feed additive) dosage ,it can prevent the primary and secondary infection of Mycoplasma, so as to relieve the infection pressure , then improve feed consumption and utilization.

B Clinical Mycoplasmosis: During this period, the infection pressure of Mycoplasma is high and clinical symptoms appear, higher, therapeutic dose of Kitasamycin needs to be applied. In addition, the respiratory symptoms at this stage is mainly due to mixed infections of mycoplasma and G negative bacteria, usually combined usage of antinfectives are recommended. Kitasamycin in combination with gram negative antibacterials work in synergy.

3.Q: What is the advantage of Kitasamycin over other antibiotics in general?

i) Kitasamycin could be used to promote the growth of chickens and increase feed efficency. As growth promoter, it has the best growth promotion effect amongst other AGPs in similar category.

ii) The withdrawal period of Kitasamycin is short, and it has a low drug resistance.

iii) Kitasamycin has the shortest residual time in livestock.

iv) To promote growth and prevent disease, Kitasamycin has a lower inclusion rate, it has good integrated economic returns.

For more information on Innokit please contact:

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