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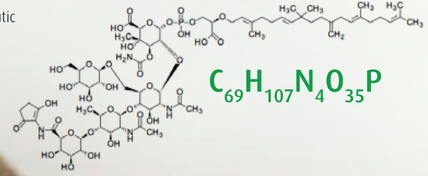
We add performance to your business

Flavomycin® is specifically developed as a performance-promoting feed additive.
It is a microflora manager fortifying a healthy balance of the gut bacteria resulting in significantly improved weight gain and feed conversion. Moreover, the stabilizing effect of **Flavomycin®** reduces shedding of food borne pathogens, securing public health.

There are no safety concerns and no residual concentrations are detectable in the tissues of food animals when supplementing with **Flavomycin®**.

Administration of **Flavomycin®** decreases antibiotic resistance. Acquired resistance to **Flavomyin®** itself has never been reported and the molecule has no therapeutic use in humans.

Flavomycin® is a 100% natural feed additive, produced by aerobic fermentation of Streptomyces ghanaensis.
It is the only phosphorous containing glycolipid antibiotic exclusively used in animal feed.
The large structure of the molecule, 1582 g/ml, prevents absorption by the gut and ensures an equal activity along the gastro-intestinal tract



$C_{69}H_{107}N_4O_{35}P$

FLAVOMYCIN®

Effective, Safe and Unique

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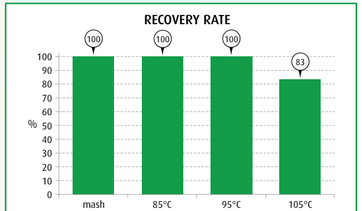
PRODUCT CHARACTERISTICS

- Flavomycin® is a feed additive marketed as a free-flowing premix.
- Flavomycin® consists of a spray-dried granular fermentation product.
- The homogenous distribution in the premixes gives no risk of segregation.
- Flavomycin® is compatible with any other feed additive or veterinary medicine.

STABILITY

Flavomycin® has a shelf-life of 24 months and is extremely stable.
The common processing methods for premixes and feed including conditioning, pelleting, expansion or extrusion have no influence on the stability and recovery of Flavomycin®.



Pellet stability of Flavomycin® at, 85°C, 95°C and 105°C with conditioning during 30s.

DOSE RECOMMENDATIONS

Species	Flavomycin® 40 (grams per ton)	Flavomycin® 80 (grams per ton)	Flavophospholipol (ppm)
broiler	50 - 300	25 - 150	2 - 12
layer and breeder	50 - 200	25 - 100	2 - 8

CONCLUSION

Flavomycin® is :

- **EFFECTIVE**
  - Increases weight gain
  - Better feed utilization
- **SAFE**
  - Improves public health
  - No withdrawal period
  - Ecological safe
- **UNIQUE**
  - Decreases antimicrobial resistance
  - No resistance against Flavomycin®

References available on request

http://www.huvepharma.com

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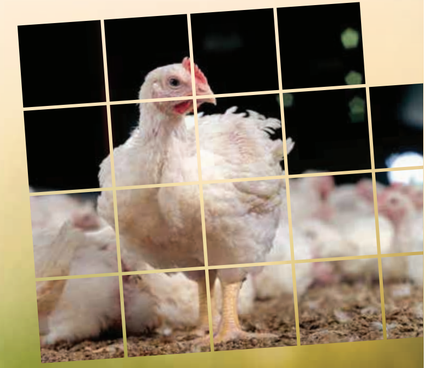

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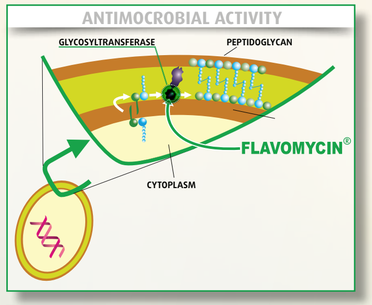
MODE OF ACTION

1. ANTIMICROBIAL ACTIVITY

Flavomycin® inhibits the transglycosylation step of peptidoglycan biosynthesis, a structural component of the bacterial cell wall. This causes accumulation of cell wall intermediates, and leads to lysis and cell death.

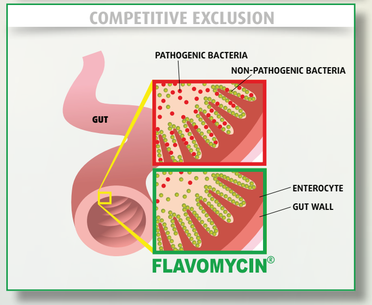
Flavomycin® is active against a broad spectrum of Gram-positive bacteria.
Susceptible Gram-negative organisms are Pasteurella, Brucella and those (particularly *Salmonella spp* and *E. coli*) that carry resistance plasmids.



2. ENFORCEMENT OF NATURAL DEFENSE SYSTEM

Flavomycin® spares beneficial bacteria. Those resident bacteria prevent colonization by pathogens through adhesion to the gut epithelium. This phenomen is called competitive exclusion.

In addition, the indigenous flora produces volatile fatty acids and antibacterial substances such as lactic acid.



3. IMPROVEMENT OF DIGESTION

Enteric pathogens can disrupt the integrity of the intestinal wall causing impaired digestion.
Flavomycin® directly inhibits those pathogens and secures a healthy microflora. The result is an improved gut morphology ensuring optimal digestion.

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UNIQUE

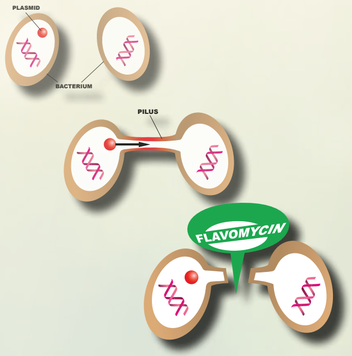
FLAVOMYCIN® DECREASES ANTIBIOTIC RESISTANCE

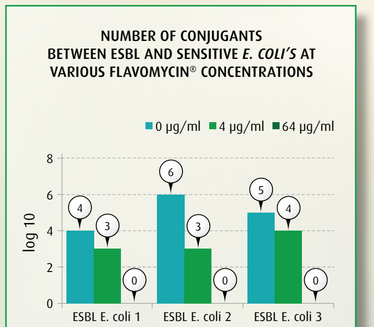
Antibiotic resistance can be acquired via transfer of extrachromosal DNA located on plasmids. Plasmids pass from one bacterium to another through bacterial conjugation.

Flavomycin® decreases antibiotic resistance by

1. Reducing the conjugation transfer of plasmids
2. Selective action against plasmid containing bacteria

Flavomycin® significantly suppresses the horizontal spread of plasmids between ESBL and sensitive accepter *E. coli's*.





Conjugation experiments with 3 ESBL E. coli's as donor and a sensitive E. coli as recipient strain were performed in broths containing 0, 4 or 64 µg/ml Flavomycin®. Transconjugants were analysed for presence of selected plasmids.

NO RESISTANCE AGAINST FLAVOMYCIN®

- There is no acquired resistance against Flavomycin®.
- Exposure of bacteria to Flavomycin® does not result in cross-resistance to other antimicrobials or in co-selection of resistant strains.
- The unique mode of action of Flavomycin® is not shared by any agent used in human medicine.

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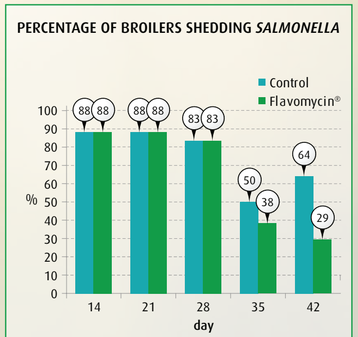
SAFE

FOR HUMANS

- Consumption of food contaminated with zoonotic agents is a serious threat for public health.
- Flavomycin® has an antagonistic effect on food borne pathogens by stabilizing the microflora and lowering the intestinal pH.
- Flavomycin® reduces the number of broilers shedding pathogens at the time of slaughter.



Forty-eight broilers were inoculated with 108 Salmonella enteritidis on day 11 and 12. Flavomycin® was added to the feed at a dosage of 9 ppm. Faeces samples were taken weekly.

FOR ANIMALS

- Flavomycin® is not absorbed by the gastro-intestinal tract and is excreted as an intact molecule.
- After feeding 20 times the highest approved dosages of Flavomycin® to broilers and layers, no residues were found in respectively blood, tissues and eggs.
- Flavomycin® has a 0 days withdrawal period.

FOR THE ENVIRONMENT

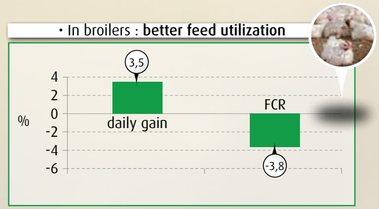
- Flavomycin® in the soil is rapidly degraded by natural micro-organisms.
- Plants do not absorb Flavomcyin®.

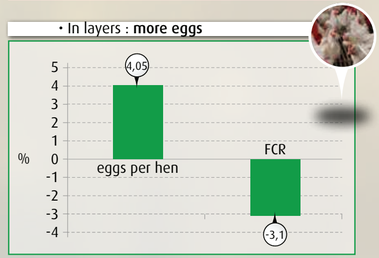
EFFICIENT

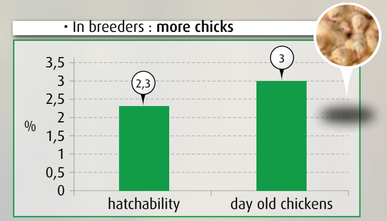
TECHNICAL PERFORMANCE

Since the discovery of the molecule in 1960, Flavomycin® has been used worldwide to improve weight gain and feed utilization in food-producing animals.

The unique mode of action of Flavomycin® guarantees:







In addition,
Flavomycin® ensures the health of the birds by :
1. decreasing the water content of the faeces resulting in drier litter and lower infection risk.
2. decreasing the damaging effect of necrotic enteritis by reduction of gut lesions and countering the growth drop.

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