Non-therapeutic antibiotic use in poultry in Kerala and measures to contain it

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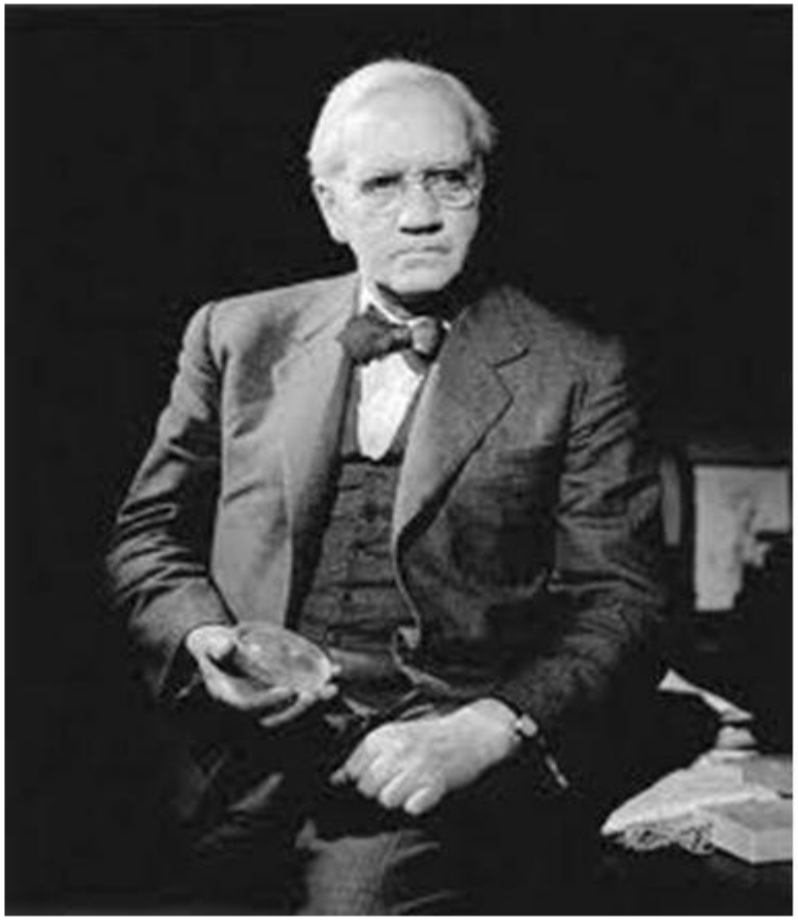
Sir Alexander Fleming discovered penicillin



"The time may come when penicillin can be bought by anyone in the shops. Then there is the danger that the ignorant man may easily under dose himself and, by exposing his microbes to non-lethal quantities of the drug, educate them to resist penicillin."

Nobel lecture, 1945

Albert Alexander (police officer)

Constable Albert Alexander (1896 – 15 March 1941) was the first[1] patient to be treated with injections of penicillin.

Albert Alexander was a constable in the police force of the County of Oxford, England.[2] In December 1940, Constable Alexander was accidentally scratched by a rose thorn on his face.[3] By the end of the month, the scratch was badly infected with both *Staphylococcus* and *Streptococcus* and Constable Alexander was hospitalised in the Radcliffe Infirmary. Despite efforts of various treatments, Alexander's head was covered with abscesses and one of his eyes had been removed.[4]

, only a small quantity of penicillin had been extracted and, although Florey and colleagues extracted any remaining penicillin from Alexander's urine, by the fifth day they had run out.[2]

Constable Alexander relapsed, and died on 15 March 1941.[4]

« A Season of Hemorrhagic FeversJune 5, 1981. Pneumocystis Pneumonia. Los Angeles. »

A Moldy Cantaloupe & The Dawn of Penicillin

By Rebecca Kreston | December 6, 2012 12:08 pm

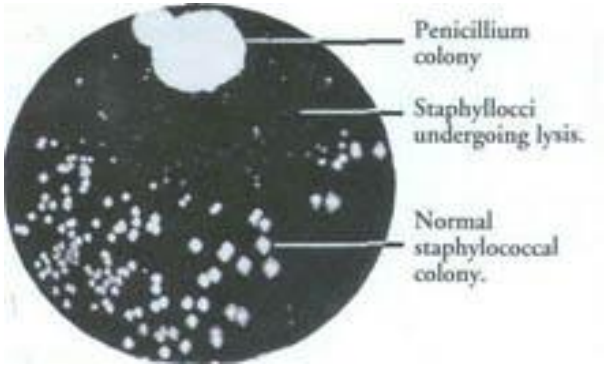
250

For something that grows so carelessly and freely on our fruits and breads, mass producing the white mold and its hidden wonder drug penicillin was devilishly difficult. After Alexander Fleming's accidental discovery of a bacteria-killing mold contaminating his cultures of *Staphylococcus aureus*, it languished as a laboratory parlor trick until World War II and the desperate need for treatments to fight bacterial infections became quickly apparent (1).

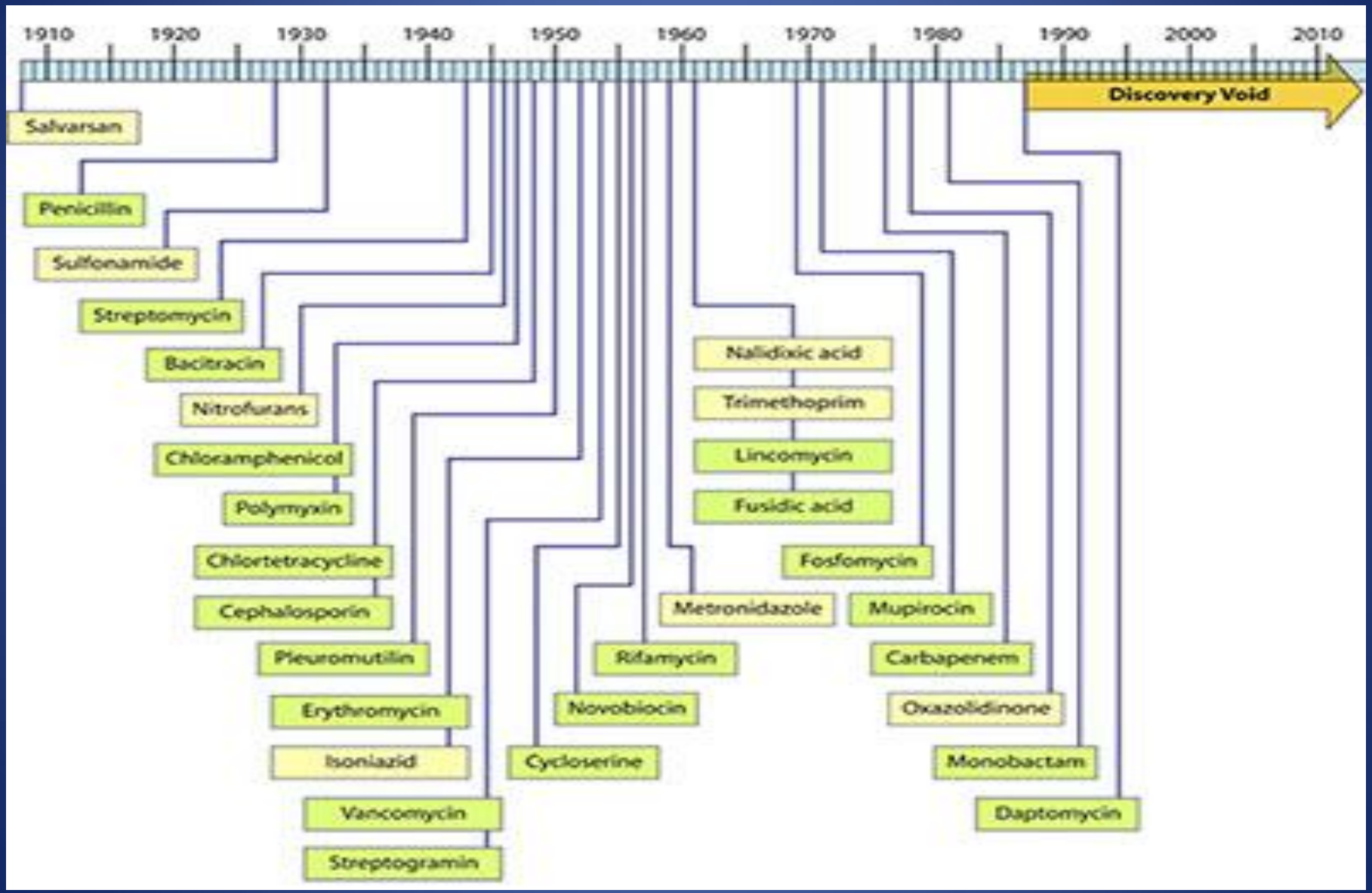
An image of Alexander Fleming's original culture of penicillium mold. In his 1929 paper, it is described as a "photograph of a culture-plate showing the dissolution of staphylococcal colonies". Image: A Fleming. Click for source.

Researchers working at Oxford University in the late 1930s had been able to isolate the penicillin compound and prove demonstrably that it could be used to treat deadly infections but the matter of transforming the spores from kitchen pests to medicinal powerhouses still remained. In 1941, struggling under the relentless blitz of their cities and factories, Britain turned to the United States to develop methods of the industrial manufacturing of penicillin (2).

It would be another fluke – the discovery of a moldy cantaloupe – that would yield a particular strain of mold that could produce prodigious amounts of this "magic bullet" antibiotic. Factories with the expert know-how on man-handling yeast and fungi into yielding their strange fruits – alcohol distilleries and mushroom factories – were then tasked with the production of penicillin (2)



DEVELOPMENT OF ANTIBIOTICS



A study published in journal Science has ranked India as the fourth largest user of antibiotics in animal feed

**"The country has a huge unregulated livestock
freely uses these drugs which are easily accessi**

India's antibiotic use in animals to increase to 82% in 2030 – Study

Medically Important Feed-Grade Antibiotics

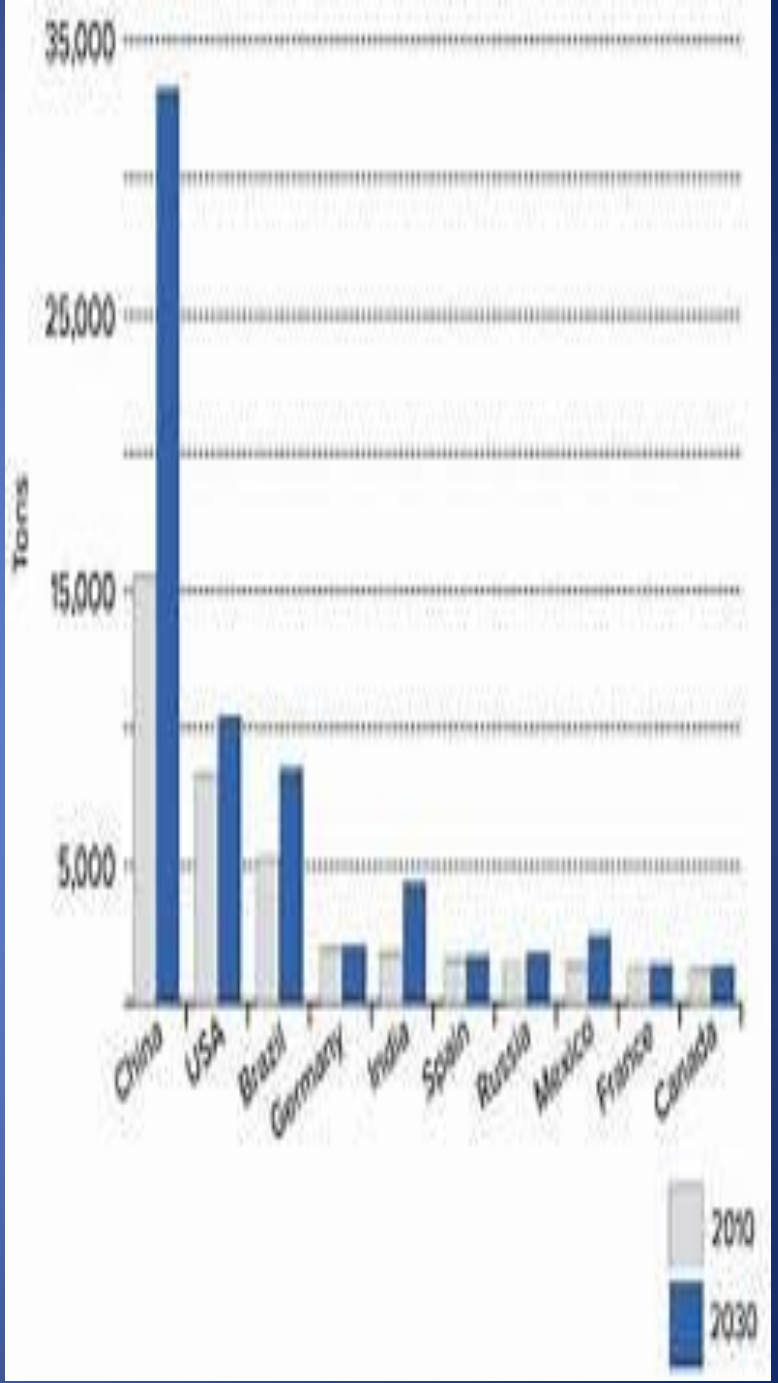
Antimicrobial Class	Specific drugs approved for use in feed
Aminoglycosides	Apramycin, Hygromycin B, Neomycin, Streptomycin
Diaminopyrimidines	Ometoprim
Lincosamides	Lincomycin
Macrolides	Erythromycin, Oleandomycin, Tylosin, Tilmicosin
Penicillins	Penicillin
Streptogramins	Virginiamycin
Sulfas	Sulfadimethoxine, Sulfamerazine, Sulfamethazine, Sulfaquinoxaline
Tetracycline	Chlortetracycline, Oxytetracycline

Medically Important Water-Soluable Antibiotics

Antimicrobial Class	Specific drugs approved for use in feed
Aminoglycosides	Apramycin, Gentamicin, Neomycin, Spectinomycin, Streptomycin
Lincosamides	Lincomycin
Macrolides	Carbomycin, Erythromysin, Tylosin, Tilmicosin
Penicillins	Penicillin
Sulfas	Sulfachloropyrazine, Sulfachlorpyridazine, Sulfadimethoxine, Sulfamerazine, Sulfamethazine, Sulfaquinoxaline
Tetracycline	Chlortetracycline, Oxytetracycline, Tetracycline

Indian Poultry Sector - Strengths

- Global No. 3 Egg producer and No. 5 Poultry meat producer in the world
- Eggs and chicken meat are the cheapest source of animal protein affordable by the masses.
- Poultry products account for more than 75% of the non-vegetarian items consumed in India.
- Industry growth rate of 12%-15% pa compared to a National GDP growth rate of 9%.



India – Poultry Industry

	Broilers*	Layers*	Breeders*
Commercial Poultry Population (Millions)	2,300*	210* (60% replacement)	21*
Growth (%)	10-12%*	6-8%*	7-9%*

Avg. Per Capita Consumption	World		India
Eggs (in Nos.)*	155 nos.*	Growth Opportunity	57 nos.*
Poultry Meat (in Kg)*	12.5 Kg*		2.8 Kg*

* - All this Data needs to be verified / Citations Needed

Source: Press Reports, Company Websites, Own Est.

CHALLENGES OF INDIAN POULTRY SECTOR THAT LED TO MISUSE OF ANTIBIOTICS……

FEED

HOUSING

WATER

MYCOTOXINS

DISEASES

AIR

CLIMATIC CHANGES

HUMAN RESOURCES

VACCINES AND SUPPLEMENTS

CONSUMER PREFERENCES

PRICE FLUCTUATIONS

Misused for the Fear of economic loss……

- Grand parent breeders
- Parent breeders
- Commercial broilers by the,farmers/integrators /companies.
- Hatcheries
- Feedmills.
- Meat processing facilities
- A 10000 female parent breeder company with 4-5 batches an year …….
- Means
- 200 crore rupees annual turn over…

How to control /conserve antibiotics……for the future…

AWARENESS TO CONSUMERS

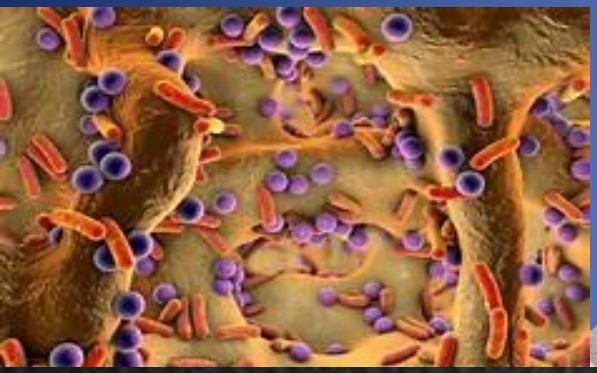
REGULATIONS

AWARENESS TO PRODUCERS

BETTER DIAGNOSTIC FACILITIES

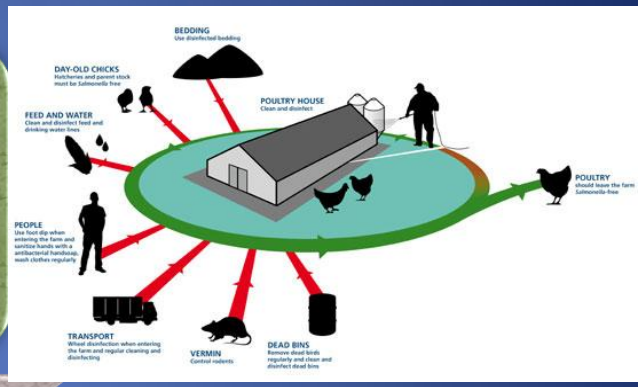
SOLUTIONS

SOLUTIONS…..



MICROBIOME

BIOSECURITY



MONITORING

APPRECIATIONS

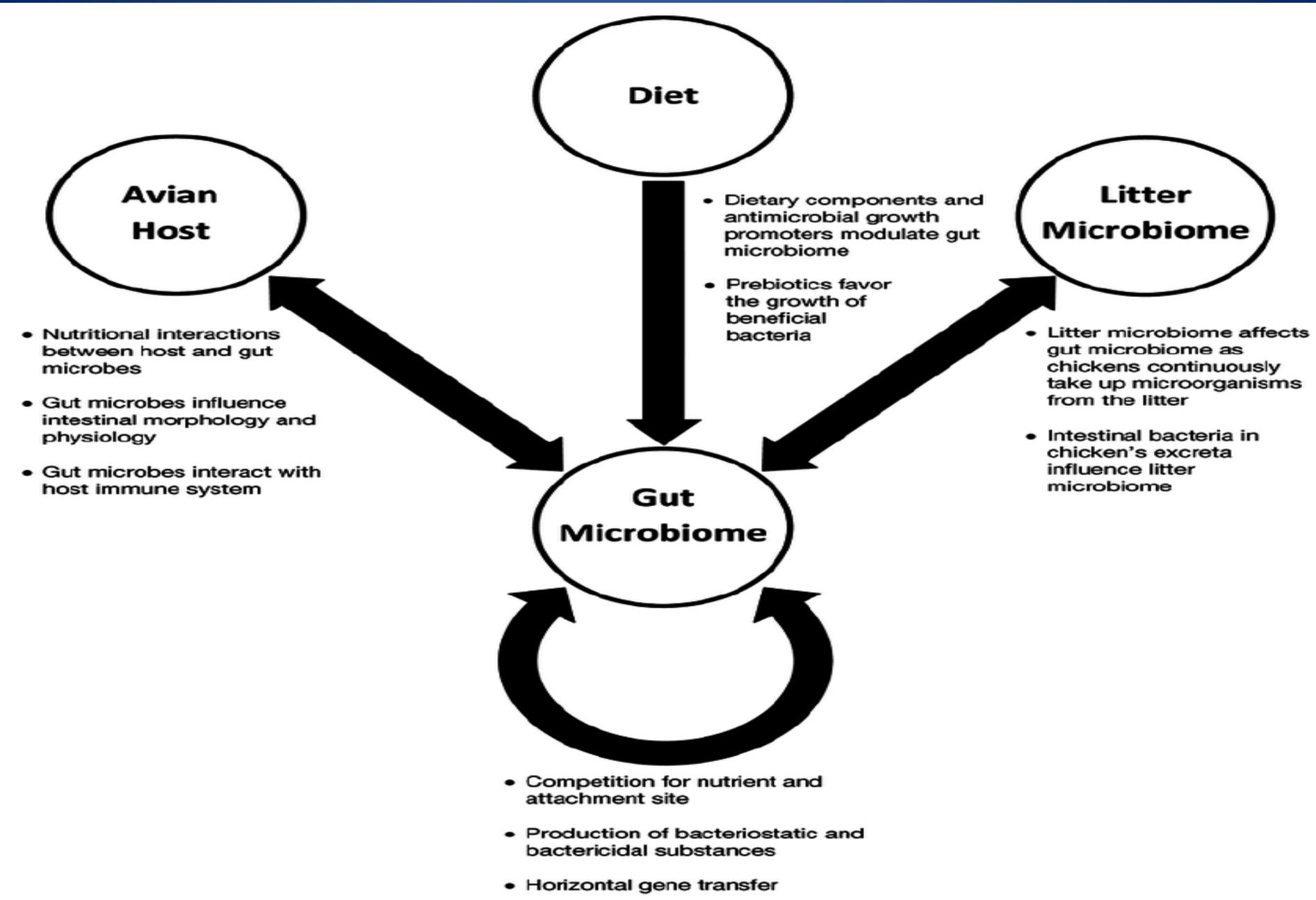
Restrict prophylactic antibiotic usage

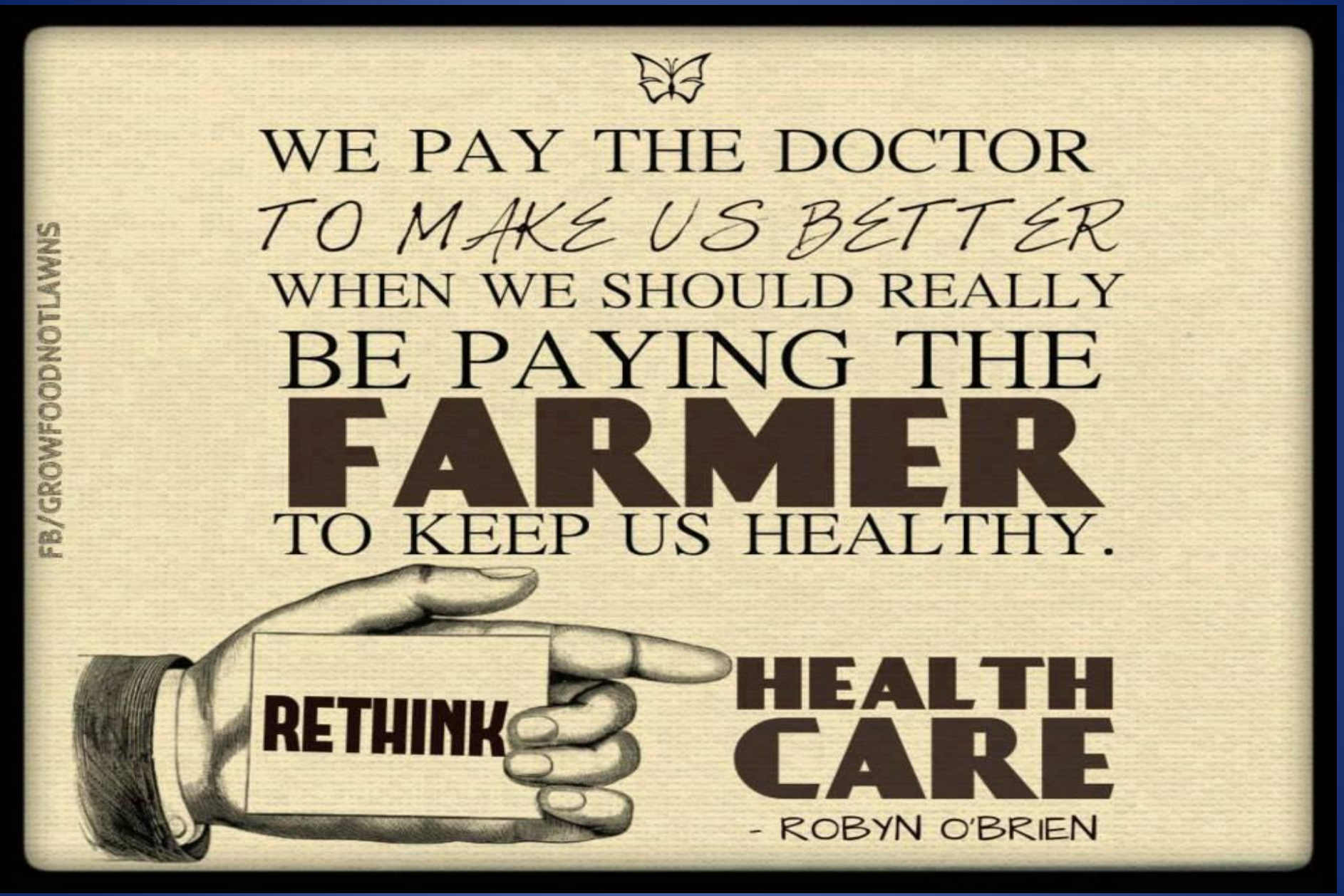
Metaphylaxis must be regulated with veterinary and lab confirmations of infections

Drugs commissionarate should ensure that H1 drugs esp antibiotics should not be mixed in animal feed and should be under valid medical prescription

It is possible…..

malampuzha Regional poultry farm has not used antibiotics since 2014….


Diet
Avian Host
Litter Microbiome
Gut Microbiome
• Dietary components and antimicrobial growth promoters modulate gut microbiome
• Prebiotics favor the growth of beneficial bacteria
• Nutritional interactions between host and gut microbes
• Gut microbes influence intestinal morphology and physiology
• Gut microbes interact with host immune system
• Litter microbiome affects gut microbiome as chickens continuously take up microorganisms from the litter
• Intestinal bacteria in chicken's excreta influence litter microbiome
• Competition for nutrient and attachment site
• Production of bacteriostatic and bactericidal substances
• Horizontal gene transfer


WE PAY THE DOCTOR
TO MAKE US BETTER
WHEN WE SHOULD REALLY
BE PAYING THE
FARMER
TO KEEP US HEALTHY.
FB/GROWFOODNOTLAWNS
RETHINK
HEALTH
CARE
- ROBYN O'BRIEN