ANTIBIOTICS IN ANIMAL FARMING
PUBLIC HEALTH AND ANIMAL WELFARE

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Antibiotics are precious in both human and veterinary medicine.

Development of bacteria that are resistant to antibiotics is a threat to modern medicine.
Growth and Intensification of Animal Agriculture

- Nearly 67.5 billion land animals were raised for consumption globally in 2008.
More Industrial Farms and Growing Production

- Globally, as of 2007, factory farms account for an 67% of poultry meat production, 50% of egg production, and 42% of pork production.

- UN FAO

- Global meat and milk production is projected to double by 2050.

- UN FAO, Livestock’s Long Shadow.
EGG PRODUCTION
EGG PRODUCTION
EGG PRODUCTION
EGG PRODUCTION
Poultry Meat
Poultry Meat
AQUACULTURE
Aquaculture
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How antibiotics are used in animal production

- For treatment of disease (therapeutic use)
- For prevention of disease (prophylaxis).
- For ‘growth promotion’
Unnatural Crowding
Why use antimicrobials in aquaculture?

Farmed Fish are Stressed and Unhealthy

• It is well established that stressed fish are more susceptible to a wide range of diseases.

• Many problems associated with disease and infection can be minimized by decreasing the effects of stress and providing appropriate environmental conditions for farmed fish.
Some examples from the Egg, Poultry, meat, and Aquaculture industries
Quinolone antibiotics such as Cipro have been used in human medicine since the 1980s, but widespread antibiotic-resistant Campylobacter did not arise until after quinolones were licensed in the mid-’90s for use in chickens.

In countries like Australia, which reserved quinolones exclusively for human use, resistant bacteria are practically unknown.

In the United States, the Food and Drug Administration concluded that the use of these antibiotics in chickens compromise the treatment of nearly 10,000 Americans a year.

In 2005, the first multidrug-resistant isolate was detected, C. jejuni resistant to
Disease from *C. jejuni* is more common in children. In developing countries it is reported in 5–20% of cases of childhood diarrhoea.

In India, one study found *C. jejuni* in 13.5% of diarrhea patients.
In a study from the United States, more than 80% of the E. coli recovered from beef, pork, and poultry products were resistant to one or more antibiotics, and greater than half of the samples of poultry bacteria were resistant to more than five drugs.

Scientists suspect that by eating animal products, women infect their lower intestinal tract with these antibiotic-resistant bacteria, which can then migrate up the urethra and into the bladder.

A number of studies have solidified the relationship between chicken E. coli and human bladder infections.
E-Coli related Child Mortality in India

Numerous Indian studies show that diarrhoeagenic E. coli contribute significantly to the burden of acute diarrhea amongst Indian children.

Diarrheal disease is a leading cause of child mortality in India.
Antibiotic Resistant E-Coli in India

A 2008 study on risk factors for antibiotic-resistant E. coli in children in rural Tamil Nadu suggests that children living in proximity to poultry farms may be at higher risk for carrying strains resistant to fluoroquinolones, tetracycline, and gentamicin. This may pose challenges to the treatment of diarrheal disease amongst Indian children.
The use of amantadine in the water supply of commercial poultry as a preventative measure against avian influenza was pioneered in the 1980s, despite evidence that drug-resistant mutants arose within nine days of application.

The use of amantadine in China has been blamed for the emergence of widespread resistance of avian influenza strain H5N1 – rendering this potentially life-saving drug ineffective during human outbreaks of H5N1.
A 2011 study conducted in West Bengal documented the emergence of amantadine-resistant avian influenza H5N1 virus in India.
Salmonellosis is a significant global public health problem resulting in substantial morbidity.

Antibiotic-resistant Salmonella has also led to serious human medical complications.

The poor ventilation, high dust levels, high stocking density, and stress levels in modern commercial chicken production have been blamed for potentially contributing to the extent of the problem.
Fish and poultry foods have been found to be significant sources of various antibiotic resistant Salmonella species in India.
The role of Industrial Aquaculture

Multidrug-resistant Salmonella enterica serovar Typhimurium phage type 104 (DT104), which is resistant to up to six common antimicrobials including ciprofloxacin, rapidly emerged in the 1980s as a global health problem.

The emergence and worldwide dissemination of DT104 has been speculatively blamed on antimicrobial use in aquaculture.
Production reduces the need for non-therapeutic antimicrobial use

Industrial farm animal production systems diminish farm animal genetic diversity by excessively favoring a few breeds of farm animals with traits of commercial interest and putting traditional breeds at risk for extinction.

Reduce the need for non-therapeutic antibiotics by allowing for more genetic diversity in farm animal production systems – avoid the monocultures typical of industrial farm animal production.
Production reduces the need for non-therapeutic antimicrobial use.

Move away from intensive farm animal production systems that stress animals, and move towards extensive, higher welfare systems that allow animals to express their natural behaviors.

This will also benefit small farmers and rural communities.
National Policy for Containment of Antimicrobial Resistance.

- Recommends the formation of intersectoral coordination committee under the chairmanship of DG CSIR to regulate the non-therapeutic use of antibiotics in food animals as per the recommendations of the DGHS in the National Policy for Containment of Antimicrobial Resistance.

- Coordination committee must regulate all antibiotic use in animal agriculture, and to impose a ban on the non-therapeutic use of antibiotics in farm animals.