

## Nitrofurans

**Prelims:** Current events of national and international importance | Health

### Why in news?

The FSSAI has directed food safety officers across India to collect samples of both branded and unbranded eggs for testing after a viral video claimed the presence of nitrofuran residues.

- **Nitrofurans** - It is an antibiotic, banned on food-producing animals.
- **Key Compounds and Their Uses**
- The four primary parent compounds in this class include:
  - **Nitrofurantoin** - Primarily used in human medicine to treat and prevent uncomplicated urinary tract infections (UTIs).
  - **Furazolidone** - Traditionally used to treat bacterial diarrhoea, cholera, and Giardia.
  - **Nitrofurazone (Nitrofural)** - Used topically for skin infections, burns, and skin grafts.
  - **Furaltadone** - Historically used in veterinary medicine for poultry and livestock.
- **Mechanism of Action** - Nitrofurans work by entering bacterial cells, where they are reduced by bacterial enzymes (nitroreductases) into highly reactive electrophilic intermediates.
- These intermediates attack multiple targets simultaneously, including:
  - **DNA and RNA** - Causing genetic damage and inhibiting transcription.
  - **Proteins** - Disrupting protein synthesis and the citric acid cycle.
- This multi-target approach makes it difficult for bacteria to develop resistance compared to other antibiotics.
- **Persistence** - Although the parent drugs metabolise quickly (half-life of less than an hour), their side-chain metabolites (e.g., AOZ, AMOZ, SEM, AHD) bind to tissues and can persist for weeks.
- **Health risks** - They are considered carcinogenic and genotoxic, meaning they can damage DNA and increase cancer risk.
- **Residues persist** - Even after stopping use, nitrofuran metabolites remain in animal tissues (meat, eggs, fish).

- FSSAI is the **statutory body** responsible for regulating and supervising food safety and standards in India.
- **Established under** - Food Safety and Standards Act, 2006
- **Ministry** - Ministry of Health and Family Welfare
- **Headquarters** - New Delhi.
- **Chairperson** - Appointed by the Central Government
- **Functions** - Lays down science-based standards for food articles.
- Regulates the manufacture, storage, distribution, sale and import of food.
- Grants licensing and registration to food businesses.
- Conducts food surveillance, inspections and testing.
- Promotes food safety awareness and hygiene among consumers.

## References

1. [New Indian Express | Nitrofurans' presence in Egg](#)
2. [Times of India | Test Eggs for banned antibiotics](#)

