

**DRUG RESIDUES: IMPACT ON
AGRICULTURE AND HUMAN HEALTH
BY**

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AT

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OUTLINE

- ▶ Definition of Drugs
- ▶ Sources of Drugs
- ▶ Drug Administration
- ▶ Uses of Drugs in Agriculture and Human health
- ▶ Drug residues: Definition and Causes
- ▶ Hazards posed by Drug Residues in Agriculture
- ▶ Remedy and Conclusion

DRUGS

- ▶ Any chemical substance other than food that affects living things (broad definition).
- ▶ Any chemical substance used in diagnosis, prevention and/or treatment of diseases of humans, animals and plants.
- ▶ Any substance taken for recreational rather than therapeutic purposes.

SOURCES OF DRUGS

- ▶ Plants
- ▶ Animals
- ▶ Micro-organisms
- ▶ Inorganic minerals/residues
- ▶ Industry (Synthetics)

ROUTES OF DRUG ADMINISTRATION

- ▶ Enteral
- ▶ Parenteral
- ▶ Topical
- ▶ 80% of all the food animals are administered drugs during their life time. Many of them are also fed medicated feed.

USES OF DRUGS IN AGRICULTURE

- ▶ To treat, prevent and control infectious and non-infectious diseases of livestock.
- ▶ To maintain herd and flock health.
- ▶ To promote animal's growth and productivity.
- ▶ To convert stress caused by the environment and management practices.
- ▶ To improve meat quality (reduce fat and increase lean meat yield).
- ▶ To protect crops from infections/diseases
- ▶ To increase revenue from farm and agribusiness
- ▶ To increase Export Reserve

FOOD PRODUCING ANIMAL SPECIES

- ▶ Bovine – cattle, cows
- ▶ Swine- pigs
- ▶ Chicken
- ▶ Turkey
- ▶ Sheep
- ▶ Goats
- ▶ Llamas/camels
- ▶ Fish

VETERINARY DRUG RESIDUES

- ▶ The small amounts of drug/medicine that remain in animal products (meat, milk, egg).
- ▶ Include the parent drug an/or their metabolites (degradation products) in any edible portion of the animal products
- ▶ May appear with the agricultural use of drugs

CAUSES OF DRUG RESIDUES

- ▶ When drugs are administered over a long period of time.
- ▶ When drugs are used at extralabelled dose
- ▶ When drug are used beyond recommendation
- ▶ When introduced accidentally through feed mill contamination or recirculation through litter
- ▶ Misuse by farmers and veterinarians

HAZARDS ASSOCIATED WITH DRUG RESIDUES

- ▶ Drug residues are regarded as public health hazards
- ▶ Animal/plant derived foods therefore pose serious effects on human health
- ▶ Most commonly used drugs associated with drug residues are Antimicrobials (Antibiotics, and Sulphonamides), Anti-inflammatories, Anthelmintics, Hormones, Pesticides, Growth Promoters & Additives)
- ▶ Drug residues in human food can cause toxicity, allergic reactions and lead to drug resistance.

HUMAN HEALTH EFFECTS OF SOME VETERINARY DRUGS

	Drugs	Human hazards
1.	Clenbuterol (B ₂ -adrenergic Agonist nonsteroidal anabolic and metabolism accelerator) (Salbutamol, Ractopamine, Zilpaterol, Terbutaline) other B ₂ adrennergic agonists	Tachycardia, muscle tremors, headaches, nausea, fever, chills (after consuming liver/beef)
2.	B-Lactam Antibiotics (Penicillins) (antibacterial)	Anahylactic reaction from consumption of beef and pork containing penicillin
3.	Nitofurans (furaltadone, nitrofurantoin, nitrofurazone, and furazolidone) (Antiprotozoal and growth promoter in poultry and swine)	Induce cancer in animals. Mutagenic potential
4	Diethylstibestrol (synthetic oestrogen, growth promoting agent)	Reproductive and teratogenic effects

HUMAN HEALTH EFFECTS OF SOME VETERINARY DRUGS

	Drugs	Human hazards
5.	Oxytetracycline (broad spectrum antibiotic)	Discolouration of milk and teeth, allergic reactions, flatulence
6.	Sulphonamides (antibacterial)	Skin allergies in consumers
7.	Chloramphenicol (broad spectrum antibiotic)	Blood dyscrasia
8.	Ciprofloxacin (broad spectrum antibiotic) (active metabolites of Enrofloxacin) a Flouroquinolone)	Tendinitis and tendon rupture in humans.

DRUG RESIDUES EFFECT ON AGRICULTURE

- ▶ Foods of plant and animal origin become unsafe for consumption.
- ▶ Poor food quality
- ▶ Revenue from farm agribusiness is reduced
- ▶ Reduced Export Reserves
- ▶ International trade is adversely affected

THE WAY OUT

- ▶ Apply drugs with utmost care and in the most efficient manner to protect humans, farm animals and crops.
- ▶ This will ensure that the lowest possible residues remain in food and in the environment.
- ▶ Enforce regulations on the use and restriction of drugs
- ▶ Obey international trade agreement (WTO) on MRLs (Maximum Residue Limits) for meat, milk, and eggs, and required withdrawal periods before animals are slaughtered or sold.

**THANK YOU FOR
LISTENING**