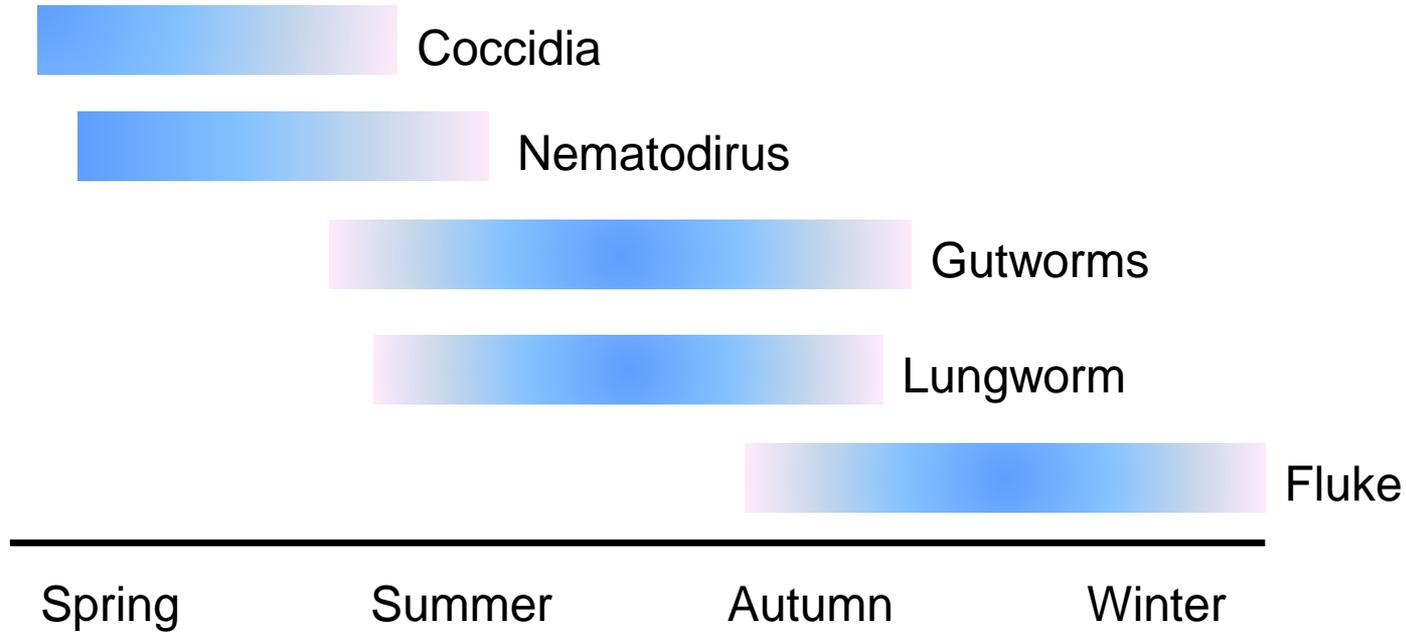


Reducing antiparasitic resistance - APR

Outline

- What is anti-parasitic resistance (APR)?
- How does it differ from AMR?
- What is its impact?
- Factors that influence the development of APR
- Prevalence in Ireland
- Good practices to slow the development of APR

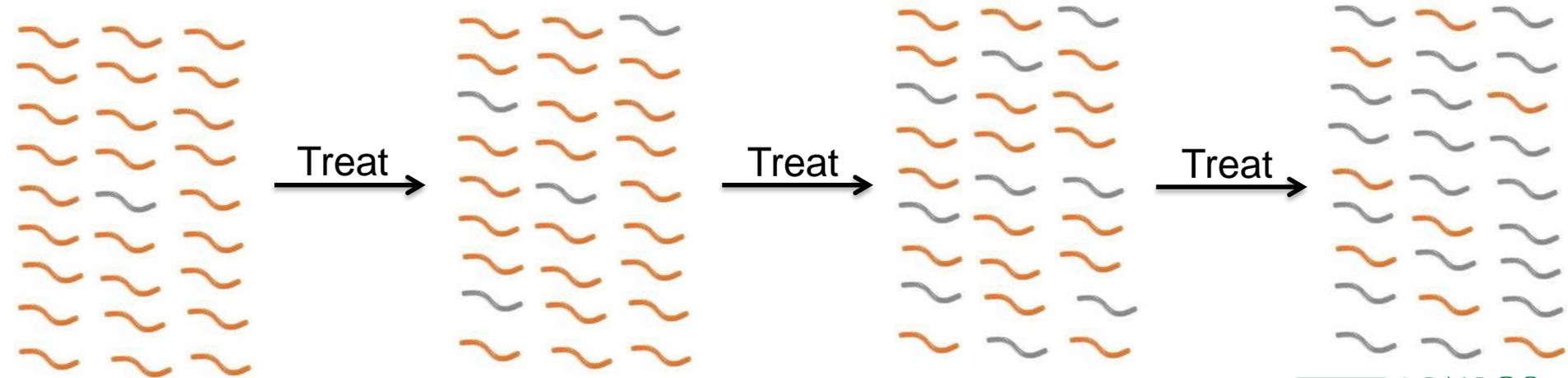
Internal Parasites of ruminants



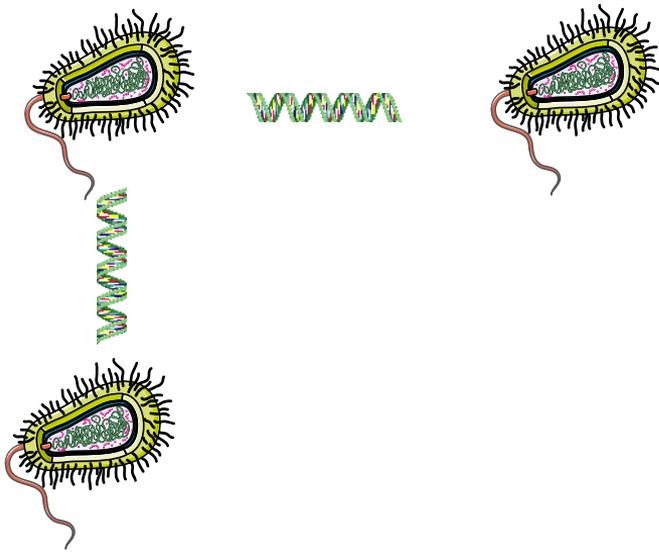
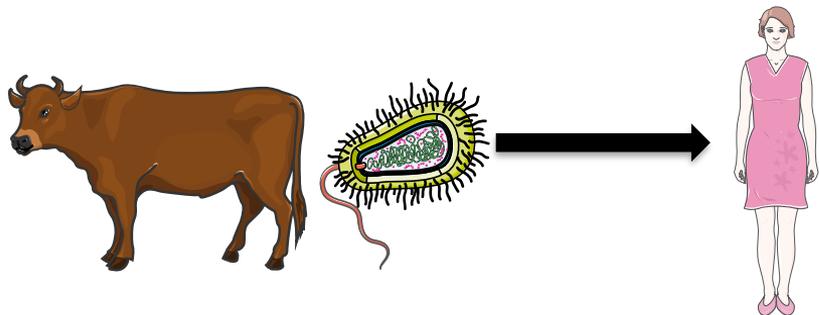
What is APR?

APR is the ability of parasites to survive doses of drugs that would normally kill parasites of the same species and stage.

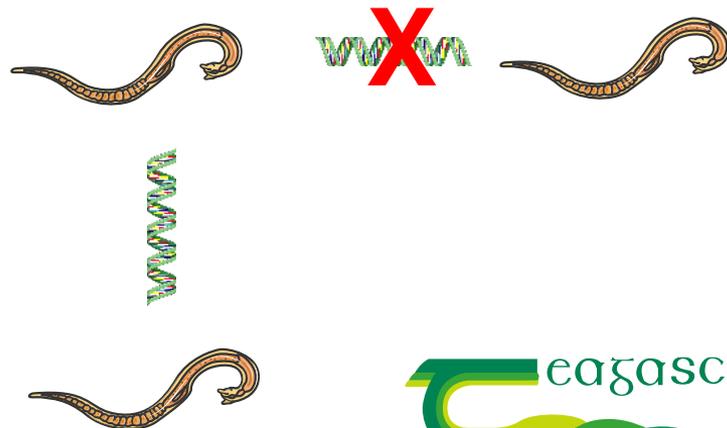
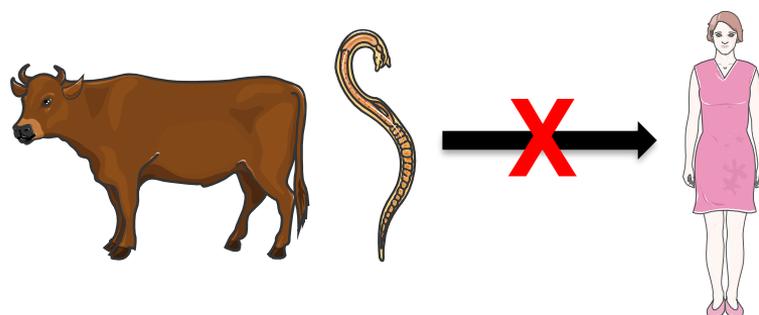
~ Susceptible
~ Resistant



AMR

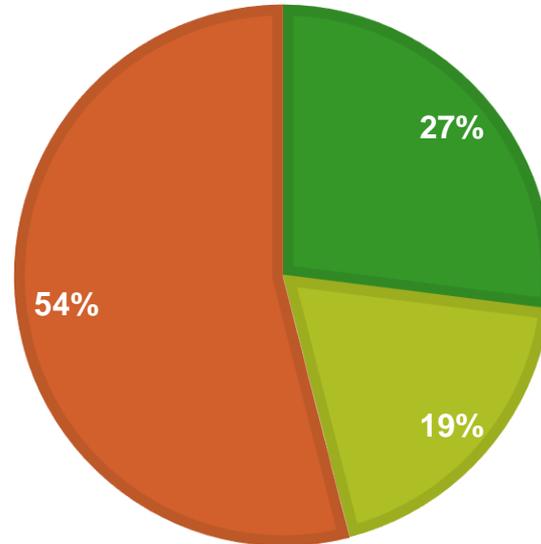


APR



Animal Health Market

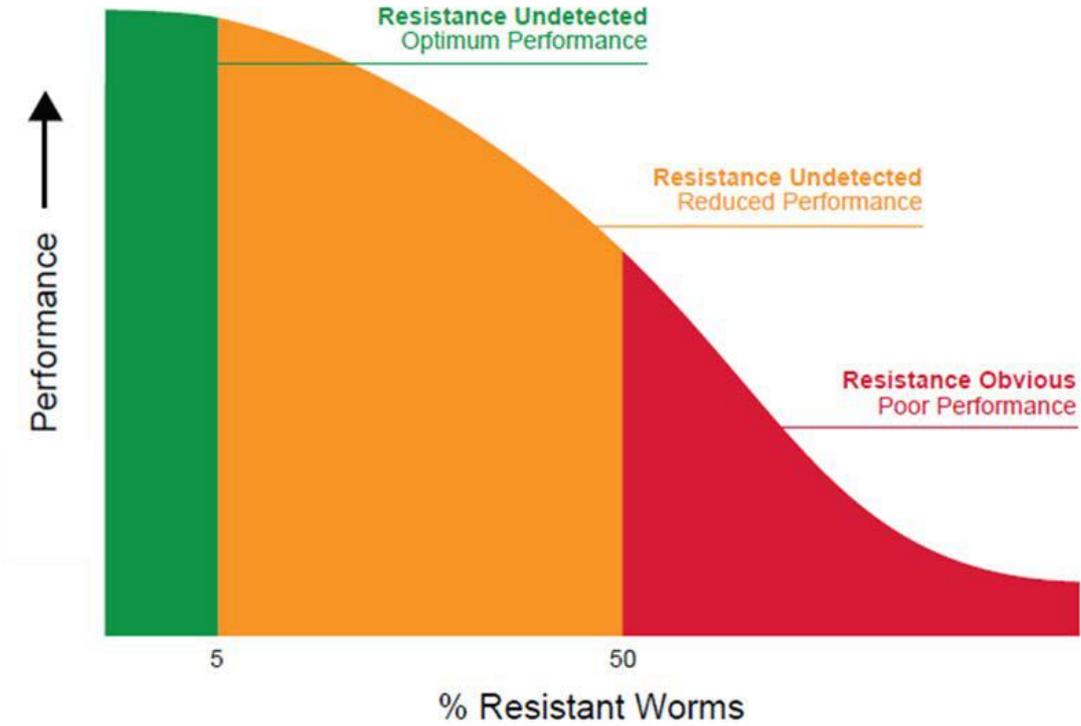
■ Anti-Parasitics ■ Vaccines ■ Other



Anthelmintic drug classes

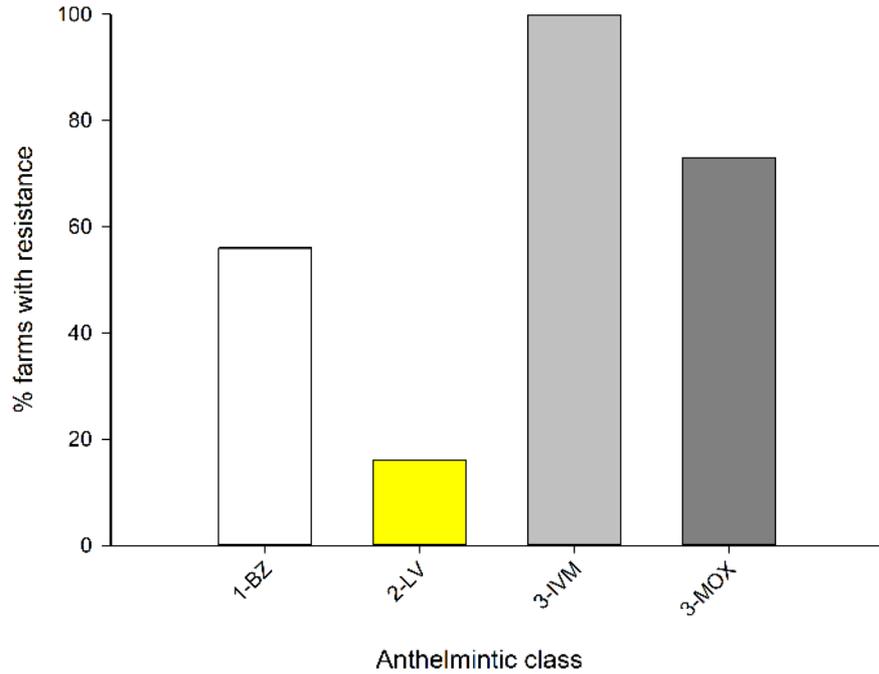
Class	Common name	First released	First resistance
Benzimidazole	White (1-BZ)	1961	1964
Levamisole	Yellow (2-LV)	1970	1979
Macrocyclic lactone	Clear (3-ML)	1981	1988

What is the impact of APR

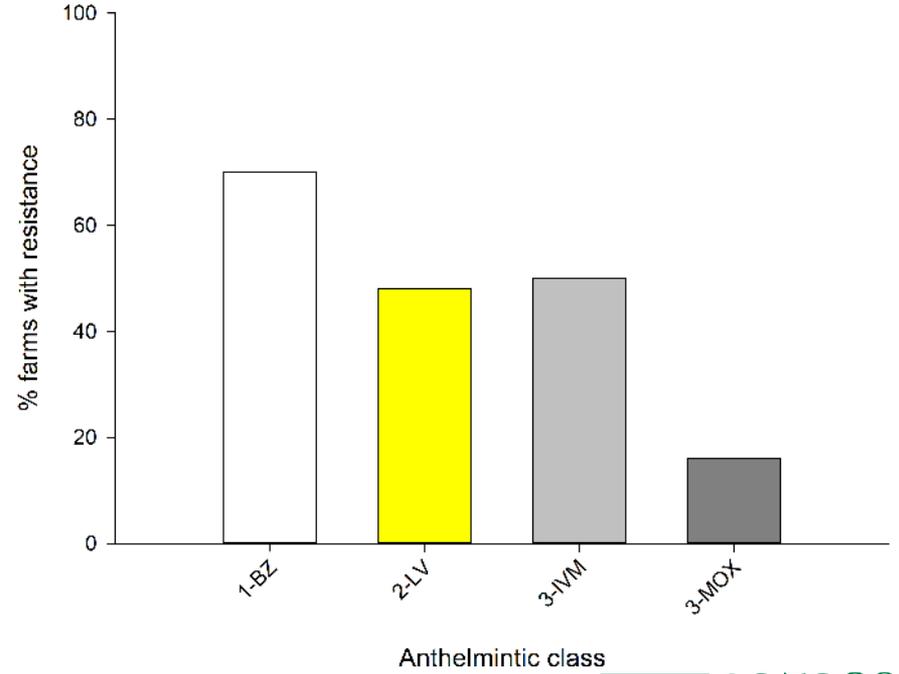


Prevalence of APR

Cattle



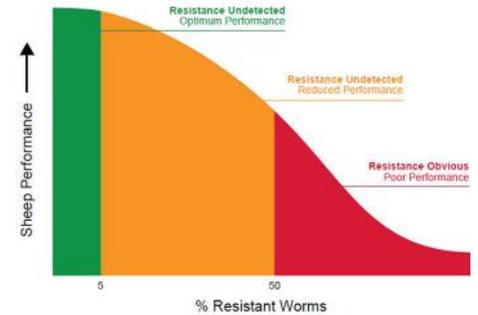
Sheep



How does APR develop?

Any practice that gives the resistant worms a selective advantage

1. Initial resistance gene frequency
2. Treatment frequency
3. Under-dosing
4. *Refugia* i.e. the proportion of the worm population not exposed to anthelmintic treatment



Refugia

— Susceptible worm
— Resistant worm

Poor refugia



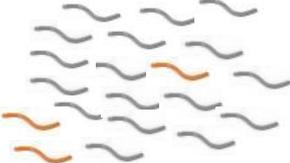
Worm population in herd/flock

Treat
→



Resistant worms on pasture

→



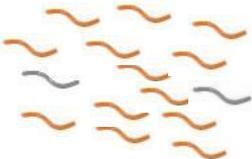
Resistance develops rapidly

Good refugia



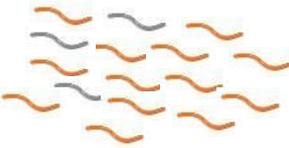
Worm population in herd/flock

Treat
→



Resistant worms on pasture

→



Resistance develops slowly

Slowing the development of APR

RIGHT product – effective against target parasite and effective on your farm

RIGHT animal at the RIGHT time – treatment is justified and maintain refugia

RIGHT dose rate administered in the RIGHT way – prevent under-dosing

Summary

- Anti-parasitic drugs are finite and precious.
- APR in gut worms is widespread in Ireland.
- We need to use anti-parasitic drugs in a sustainable manner to ensure they continue to work into the future.
- Maintaining refugia will slow the further development of resistance
- Do things **RIGHT!**