



COCCIDIOSIS

Agenda:

Economic importance of coccidiosis

What is coccidiosis?

Life cycle of *Eimeria* spp.

How is it spread?

Introduction to control of coccidiosis



Economic Importance of Coccidiosis

- In 1995 – total cost of coccidiosis in chickens in UK is £38,588,795
- → 80.6% is due to effects performance
- → 17.5% due to cost of chemoprophylaxis and treatment
- Total cost of poor performance due to coccidiosis = 4.54% of gross revenue from UK sales of live broilers

[Int J Parasitol.](#) 1999 Aug;29(8):1209-29.



Economic Breakdown

- Total cost = 4.54% of gross revenue from UK sales of live broilers
- 80.6% of that cost is due to zootechnical impact on bird performance (weight / FCR / Mortality)
- 80.6% of 4.54% = 3.66% of gross revenue cost in performance



Economic Breakdown

- 3.66% of £38 million = £1,412,349.90
- In Euros = €1,645,965.58

- **Total cost of poor performance due to coccidiosis = €1,645,965.58 out of €44,971,736.94 in 1 year**



Introduction to Coccidiosis

What is coccidiosis?

Eimeria spp. = unicellular parasite

Direct life cycle

Very specific for host

Very specific sites for development

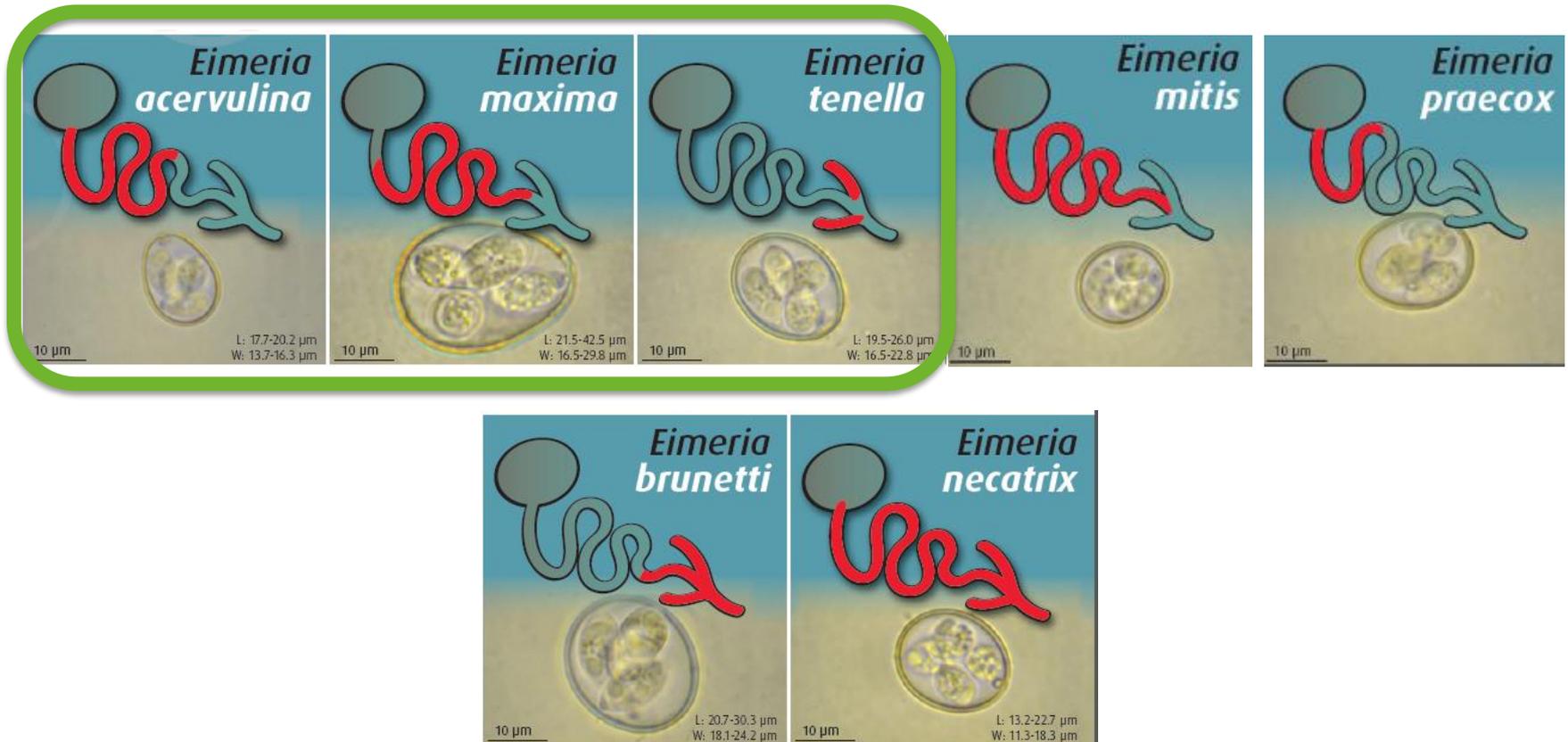
Very specific for cell types

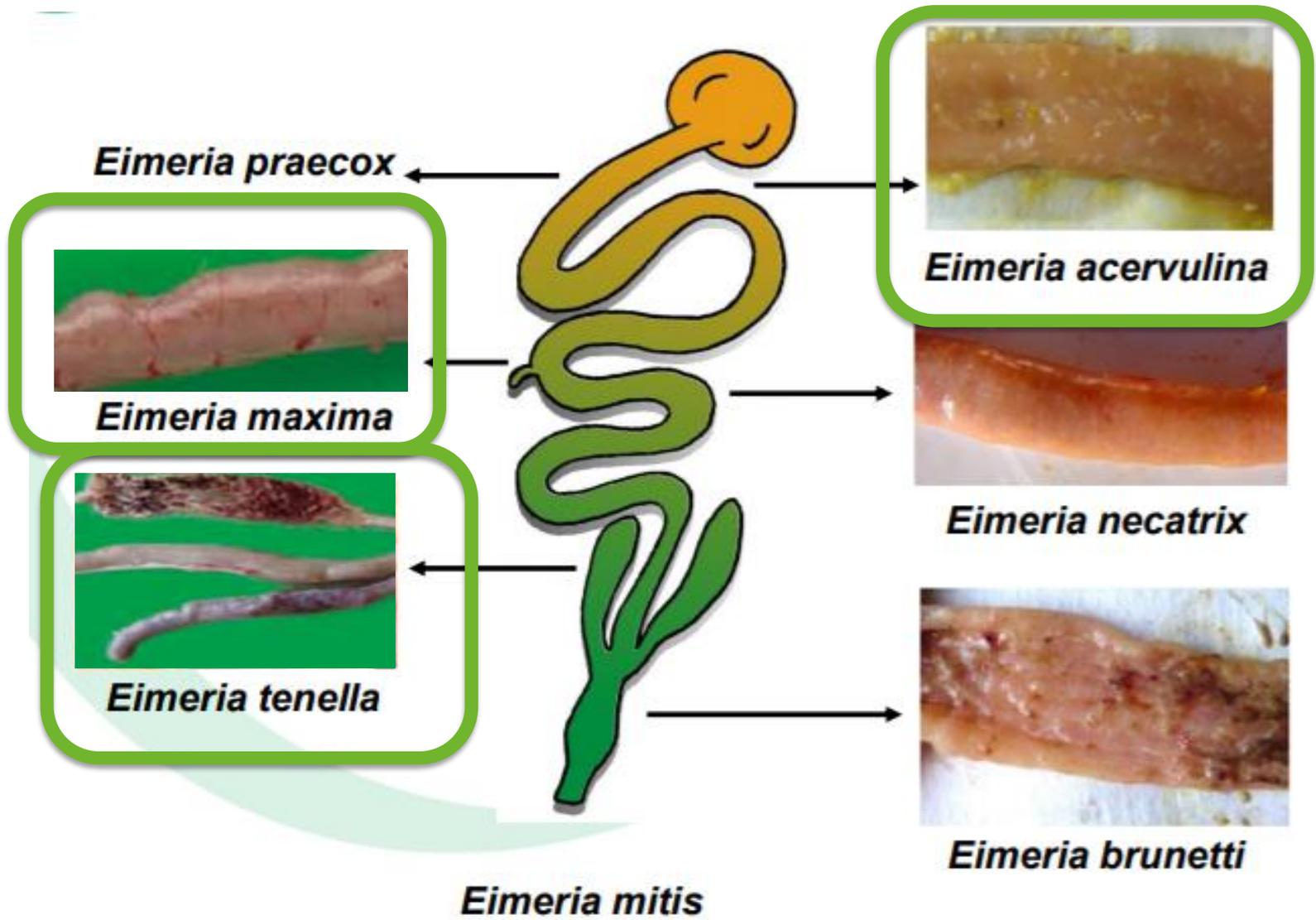
Difference in pathogenicity

Appearance of gross lesions



Localisation of Infestation





Life Cycle of *Eimeria*

Sporulation

Sporogony: stage when oocysts (free living form in the environment) sporulate in order to become infective

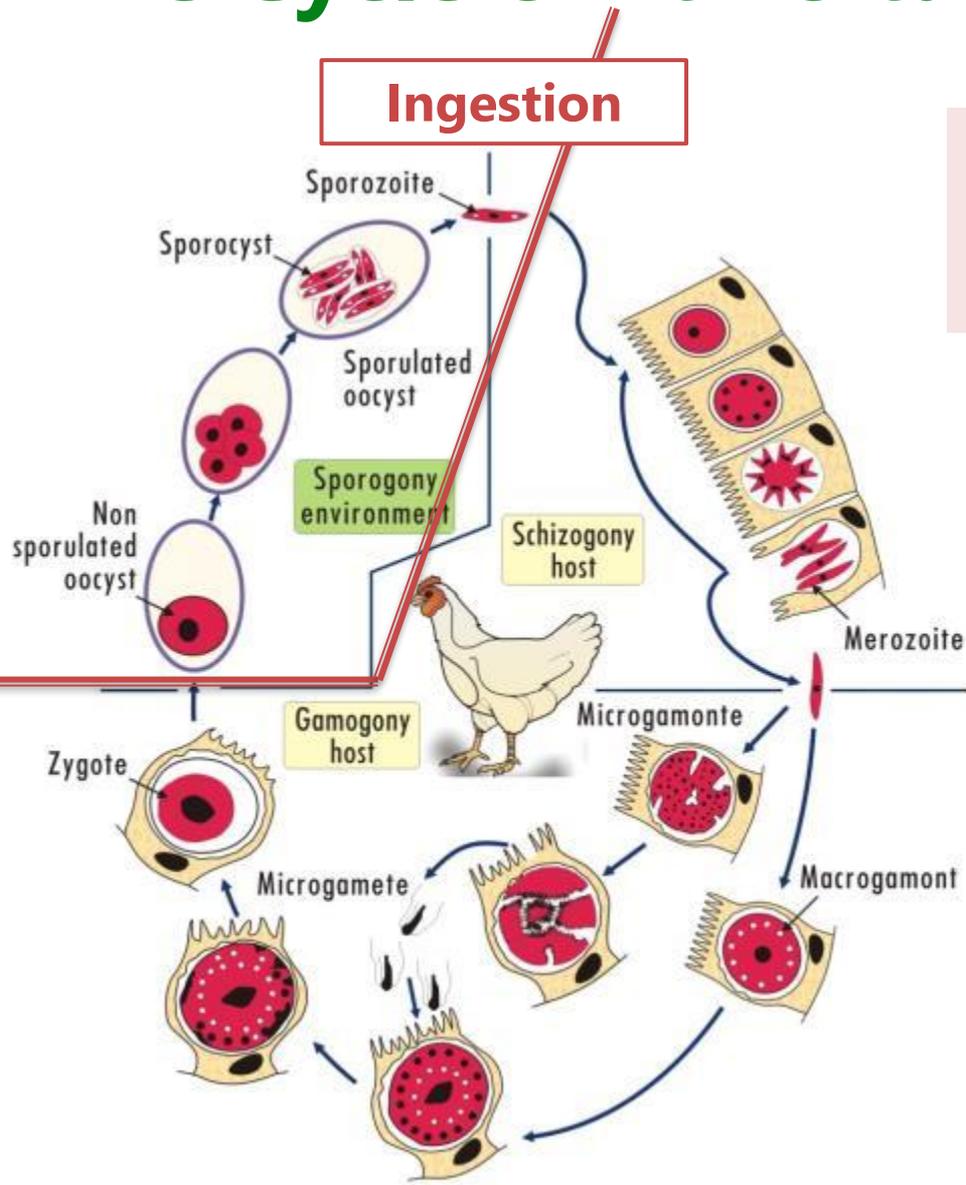
Excretion

Ingestion

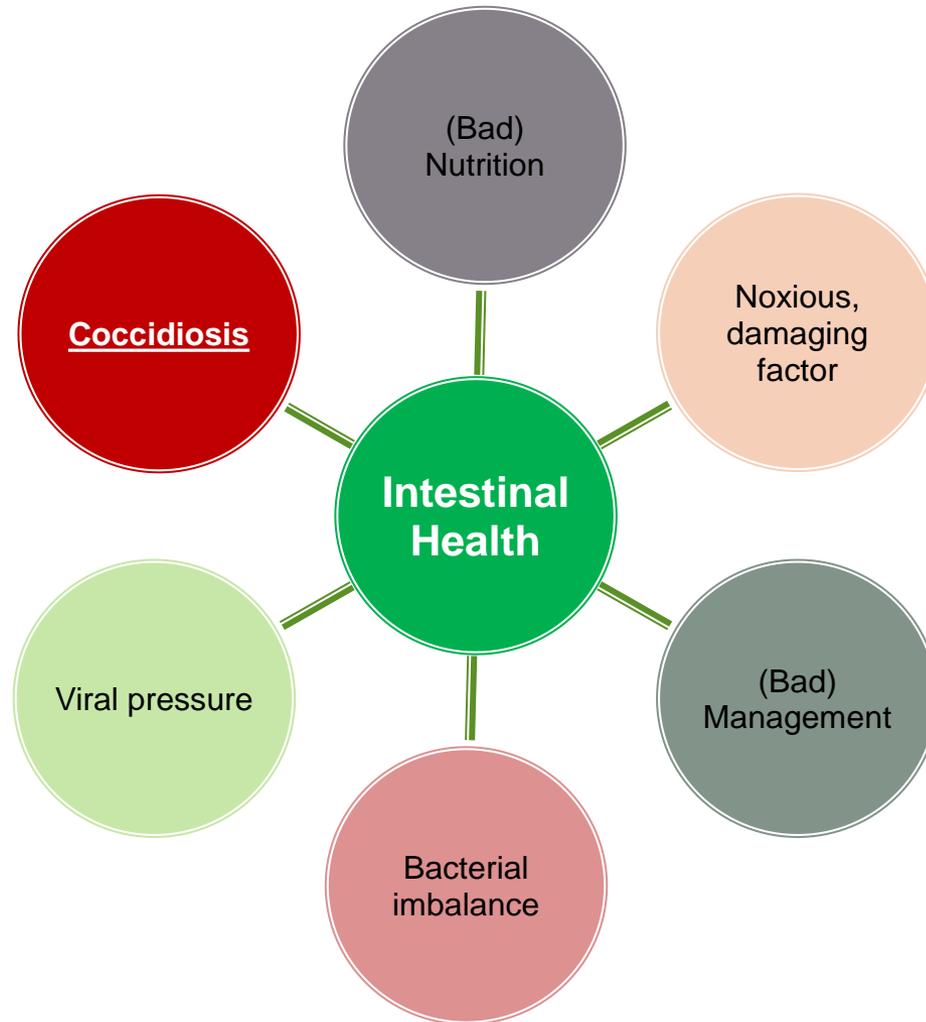
Schizogony: sporozoite (infectious form) penetration in the host cells and series of asexual multiplications

Multiplication

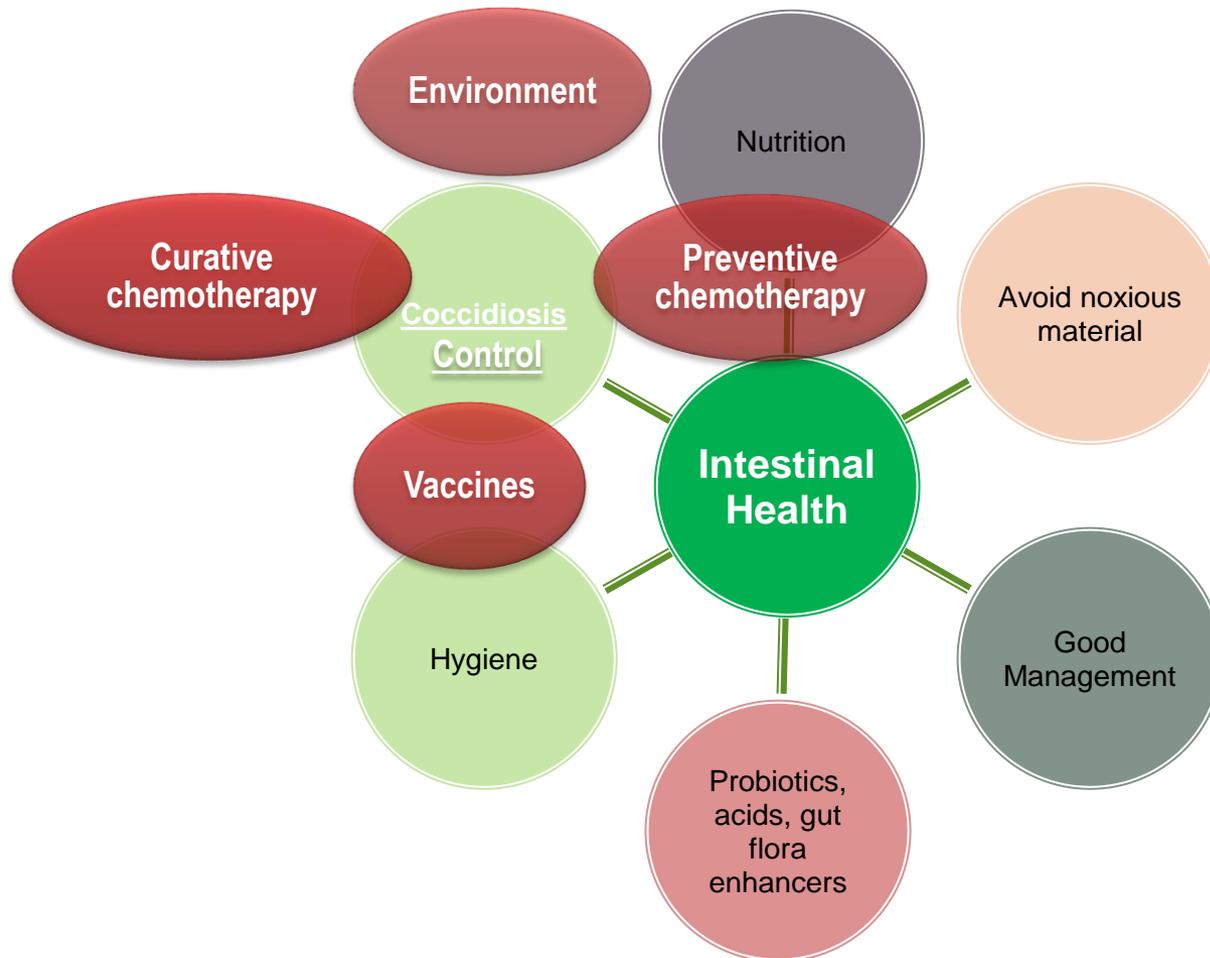
Gamogony: Sexual stage of the life cycle leading to fertilization, zygote formation and oocyst output in the environment



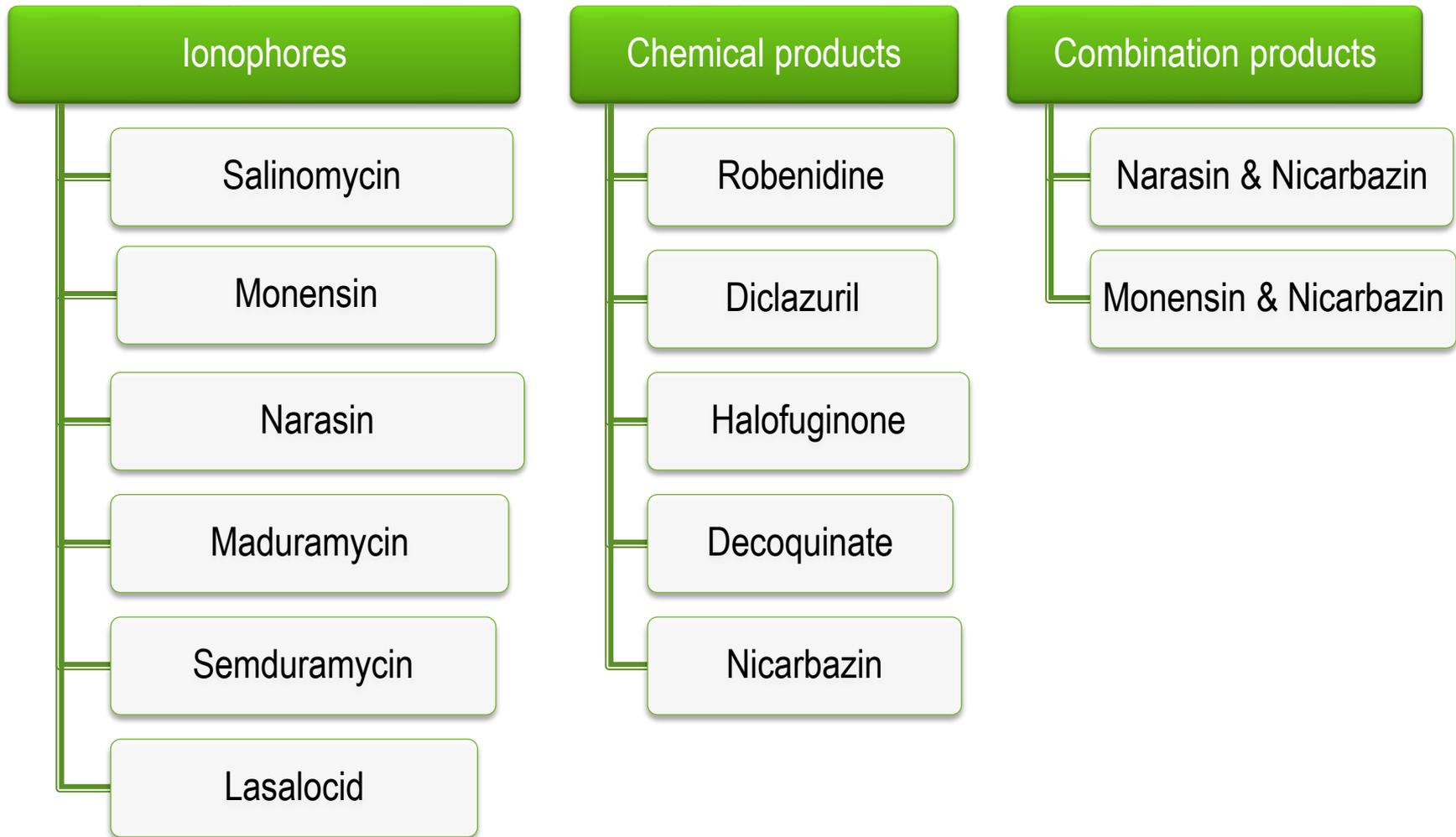
Coccidiosis is a Multifactorial Problem



Coccidiosis Requires an Integrated Approach



Chemotherapeutics



Differences between products

Ionophores

Salinomycin, Monensin,
Narasin, Maduramycin,
Semduramycin, Lasalocid



Slow resistance development
Antibiotic activity



Narrow safety margin

Chemical products

Robenidine, Diclazuril,
Halofuginone,
Decoquinatate, Nicarbazine

Safer (some exceptions)
Very efficacious

Quick resistance development
No antibiotic activity



Vaccination against Coccidiosis

What is the effect of vaccination?

Jeffers (1976) showed that the introduction of massive numbers of drug sensitive coccidia could replace drug resistant coccidia

This then increases sensitivity of coccidia to ionophore and chemical products in the following crop



Coccidiosis vaccines

Live “virulent” vaccines

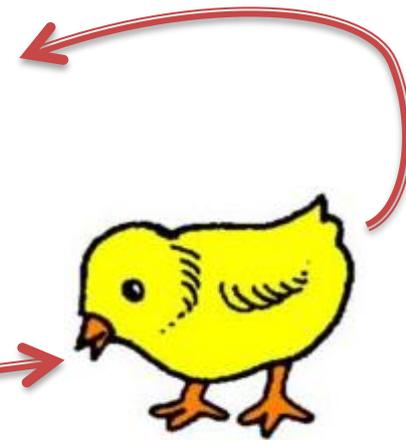
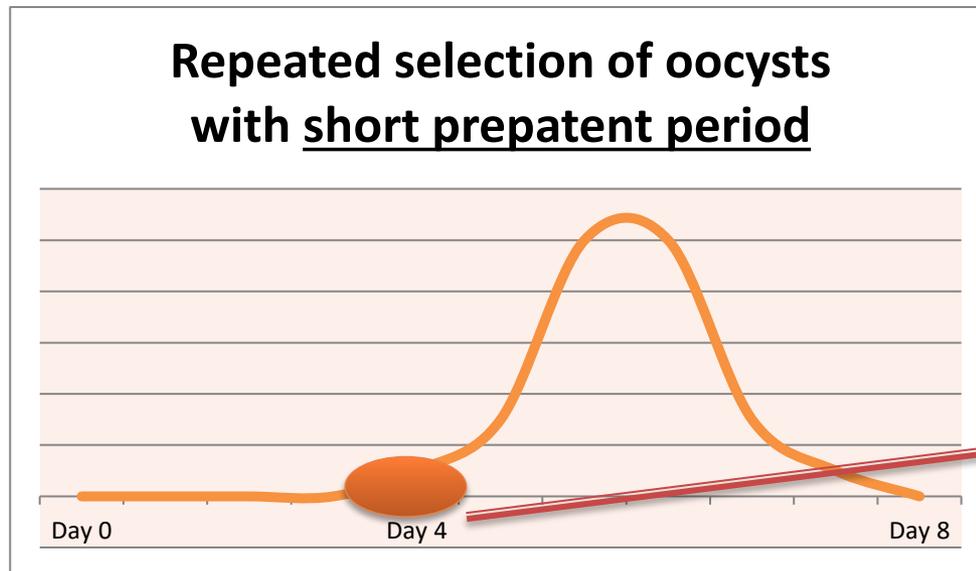
- Since 1952

Live “attenuated” vaccines

- EU
- Methods for attenuation:
 - Heat treatment
 - X irradiation
 - Passage through embryonated eggs
 - Selection for precocity



Coccidiosis vaccines



SPF birds



Summary and Discussion Points

- Huge damage caused by coccidiosis
 - Direct damage → disease, mortality and reduced performance
 - Indirect damage → dysbacteriosis, enteritis, wet litter, increased susceptibility to other disease
- Damage must be minimised by appropriate use of anticoccidial products and programmes alongside on-farm management
 - Coccidiostats and vaccines form part of the control strategy
 - Cleaning and hygiene
 - Minimising stress for birds
- Cost of coccidiosis = 3.66% of gross revenue cost in performance



**Thank you for your attention and
please don't hesitate to ask any
questions!**

