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Presented at:



*“From Egg to Plate – The Influence of Gut Health”
Symposium*

Back to the Future – Cocci Management going forward

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If I could predict the future, I would



Why are we talking about Cocci control?

- Removal of antibiotics – voluntary or regulatory
- ↑ organic production
- Greater cocci resistance to Ionophore and ↑ chemical anticoccidials
- Coccidia vaccine use
- Changing genetics

Survey of Southeast U. S. Broiler Veterinarians – September, 2012

- 12 Questions
- 17 Broiler Industry Veterinarians
- 30 Complexes Represented
- 9 States (AL, AR, GA, KY, LA, MS, NC, SC, & TX)

Top 5 Broiler Issues

Ranked by Respondents

- #1 Coccidiosis
- #2 Necrotic Enteritis
- #3 Infectious Bronchitis
- #4 Infectious Process
- #5 Infectious Bursal Disease

Change in Cocci Control Broilers Last 3 Years

	<u>Chemical</u>	<u>Ionophore</u>
Increased	6*	2
Decreased	2	7
Unchanged	1	0
Not used	0	0

*Number responses

*Herrick and Holmes, 1936, effect of sulfur on coccidiosis in chickens

* Shumar and Callender, 1967, Monensin, a new biologically active compound...

Clinacox

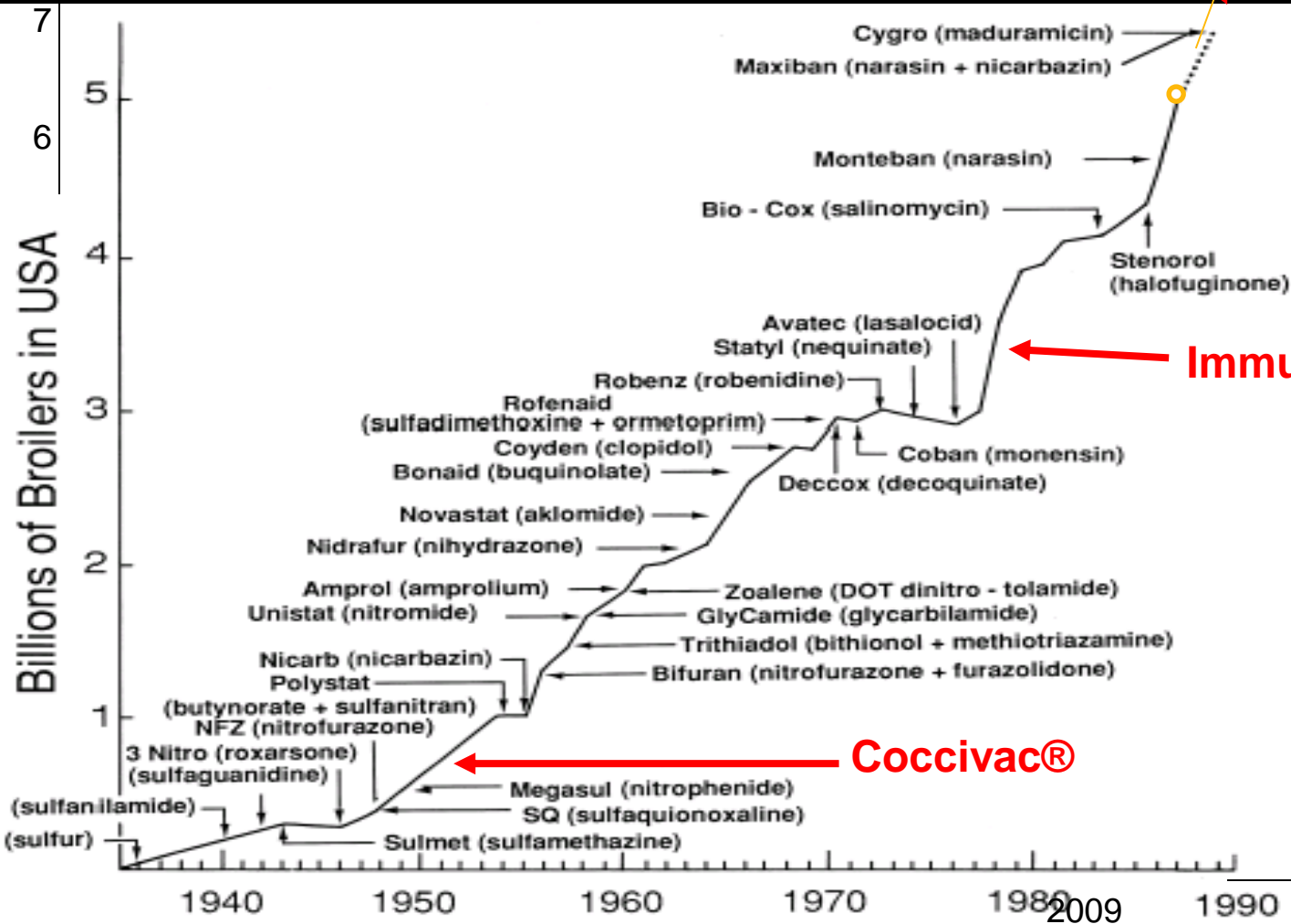
Aviax

Inovocox®
HatchPak III

Advent®

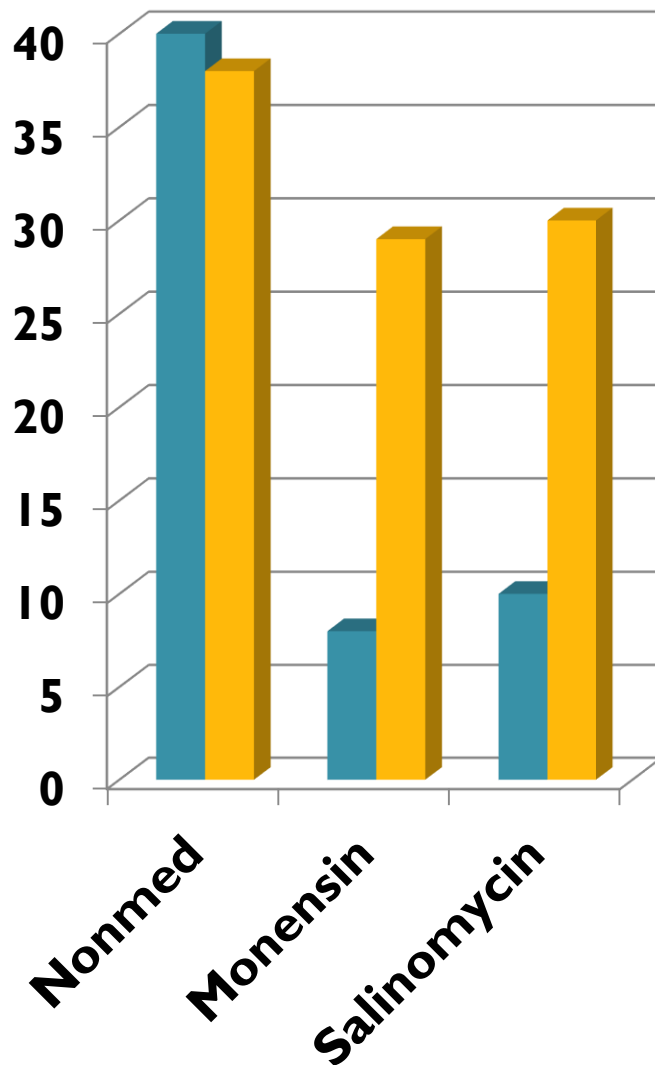
Immucox®

Coccivac®

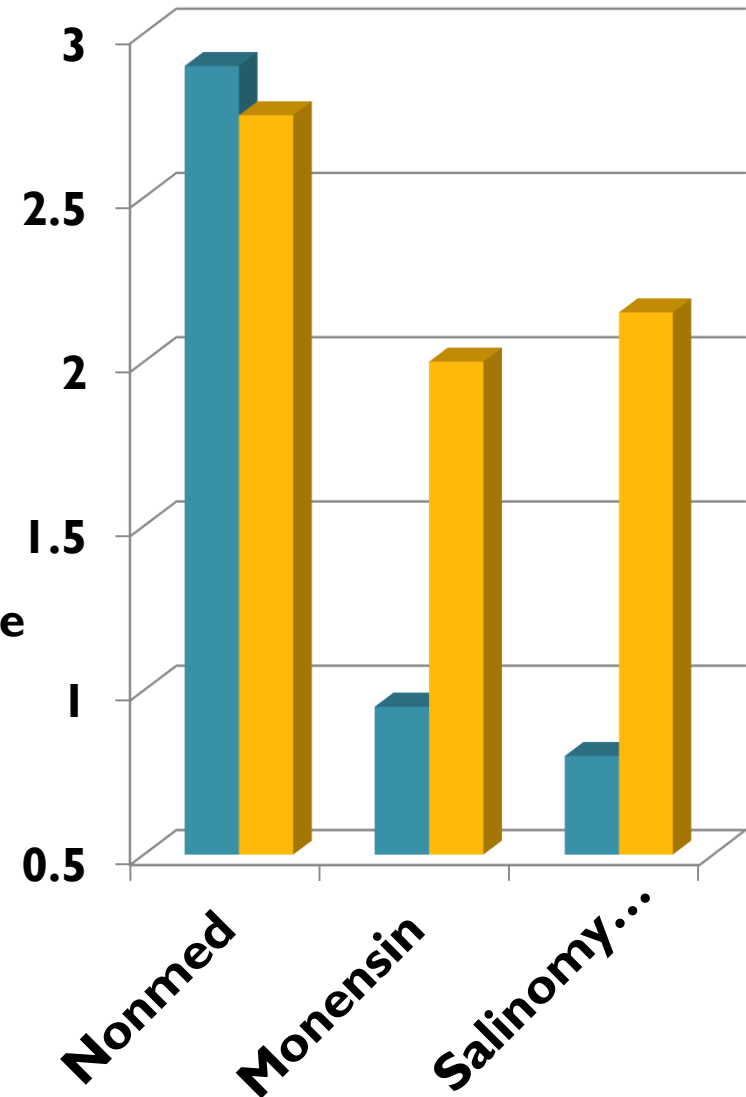


Anticoccidial Sensitivity/Resistance

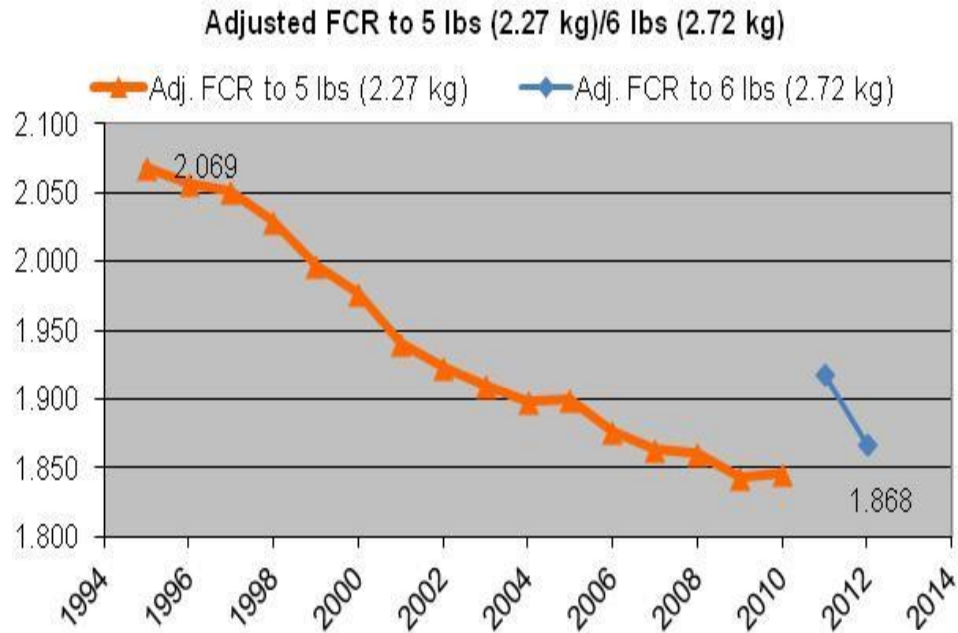
% Wt. Loss



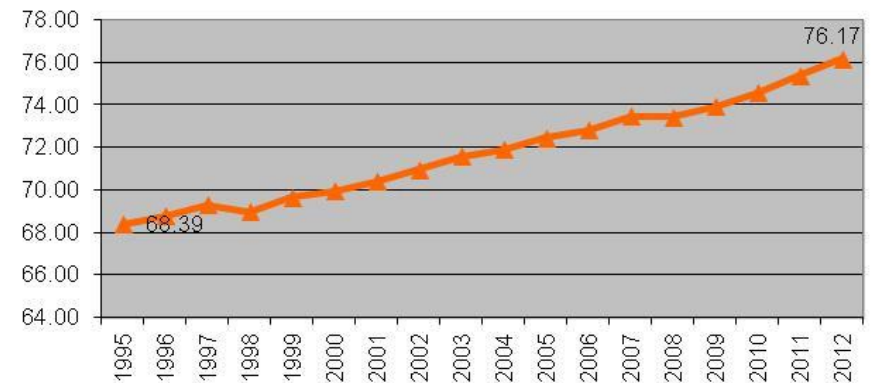
Lesion Score



The Future



% Eviscerated Yield of Live in the USA



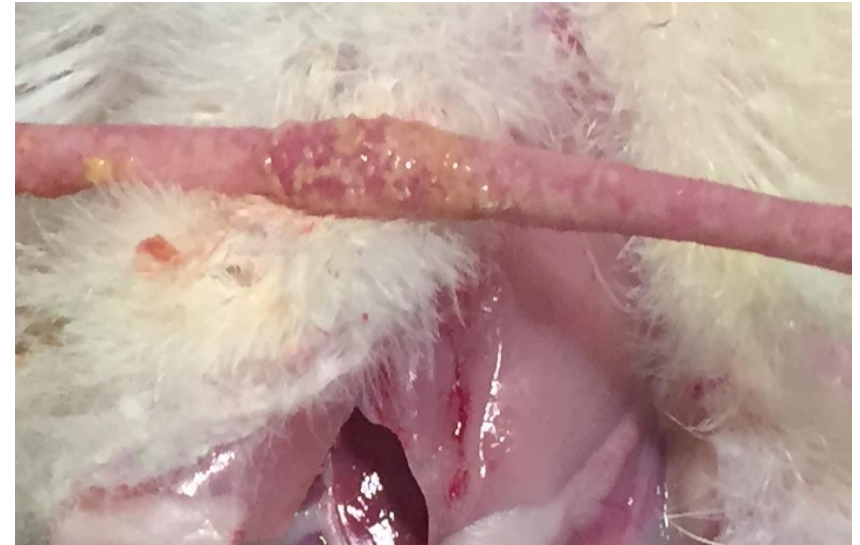
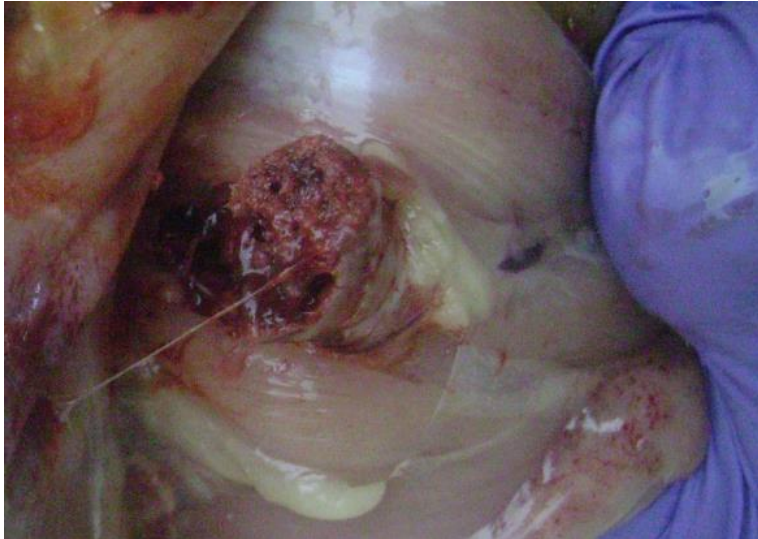
Slides courtesy of Dr. G. Rosales, Aviagen, Inc.

The Future - **Today**



6 Week Old Broiler: 1957 vs. 2012

What can we expect if we don't relearn Cocci control?



Scenario I

- Company has a problem on many farms in 28 to 35 day old broilers
- Increased mortality evenly distributed in houses
- Also a uniformity issue in many houses



- Ionophore Cocci program
- AGP used

Scenario I

Necropsy



Healthy Intestines?

Scenario 2

- Multiple farms affected
- Clinical signs visible 41-46 days
- Tunnel ventilation & evaporative cooling system
- Coccidiosis control: salinomycin 60 gm/ton
- Body weight, FCR on previous flocks average
- Litter management: Clean out every flock



Scenario 2

- Poor uniformity
- Increase mortality
- Leg Problems: mild to severe lameness (<1%), valgus, swelling of the femoral-tibial joints
- Mucoïd/orange droppings



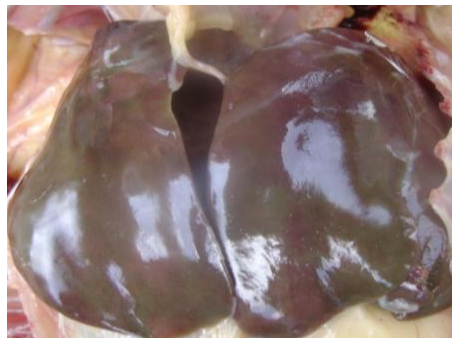
Scenario 2

POST MORTEM LESSIONS

- Tenosynovitis/arthritis (involving tibiotarsus joint & flexor tendons)
- Femoral Head Necrosis = Bacterial Chondronecrosis w/ Osteomyelitis (BCO)
- Osteomyelitis-green liver discoloration
- Spondylitis in thoracic vertebrae



Colisepticemia



Scenerio 2

POST MORTEM LESSIONS

- Airsacculitis
- Pericarditis-perihepatitis
- Coliform cellulitis (IP)



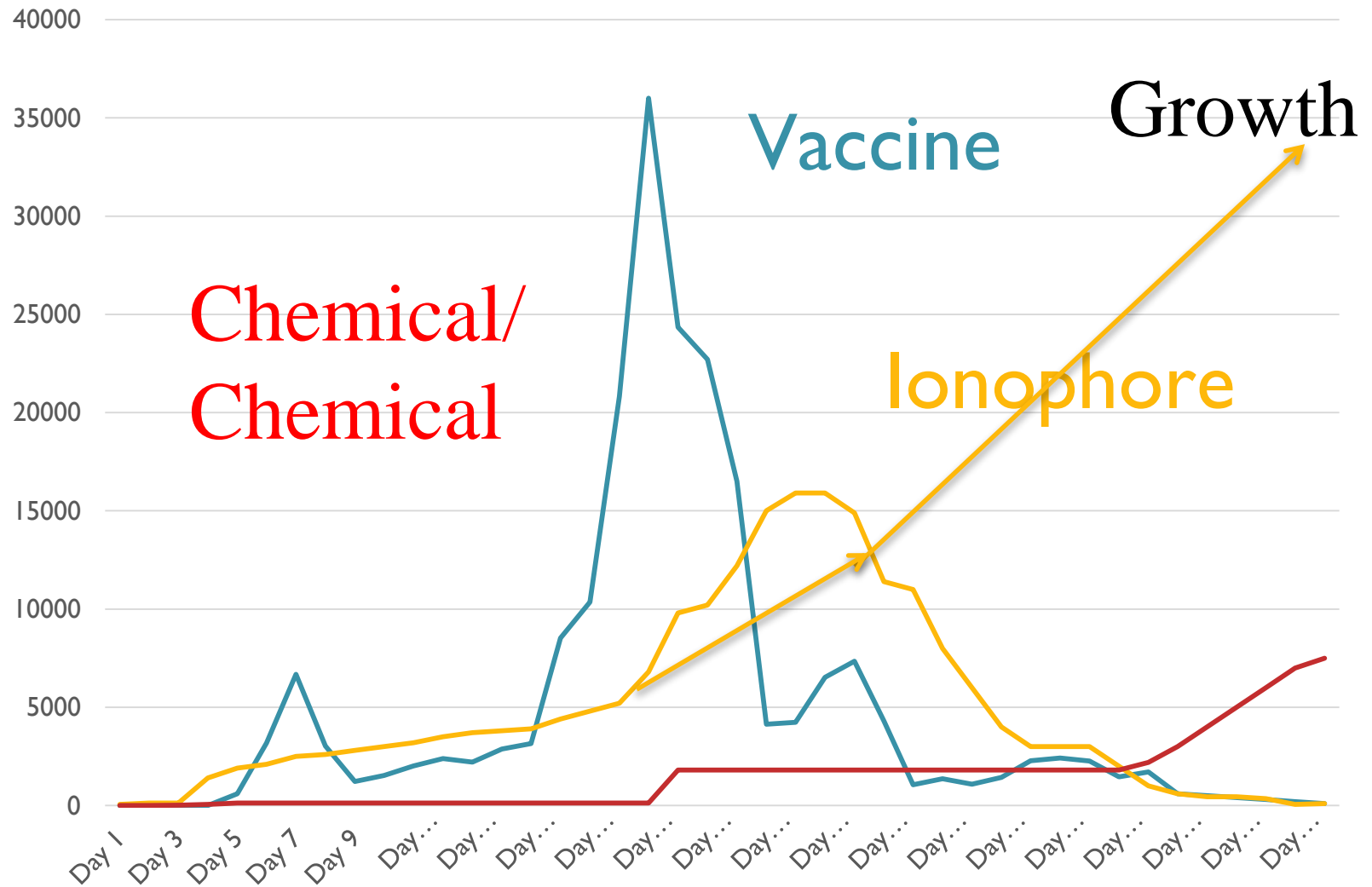
Healthy Intestines? – Cocci Control Failure?

Cocci control is key to control of:

- Necrotic enteritis
- Gangrenous dermatitis
- Osteomyelitis – FHN, vertebrae osteomyelitis
- Airsacculitis (down birds)
- and attaining genetic potential in feed efficiency and growth rate

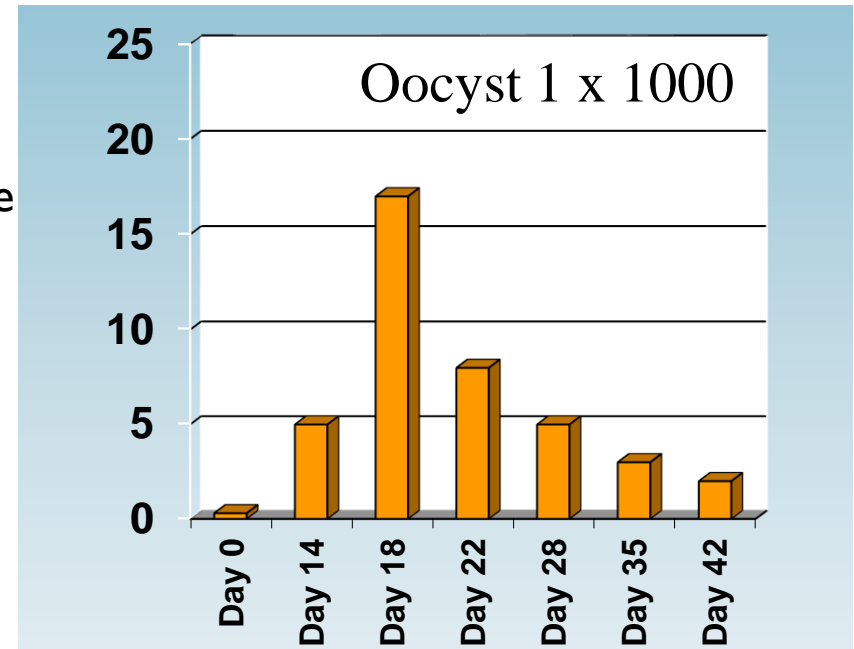
Whether ABF or Traditional

Oocysts Shedding Pattern



Coccidia Cycling

- Chickens vaccinated on day of hatch
- Oocyst shedding peaks – 18 days
- As immunity develops, the number decrease
- **Damage to mucosa from 7 to 22 days with major damage ~ 18 to 21 days**



(Mathis, 2001)

So what are our options?

*Herrick and Holmes, 1936, effect of sulfur on coccidiosis in chickens

* Shumar and Callender, 1967, Monensin, a new biologically active compound...

Clinacox

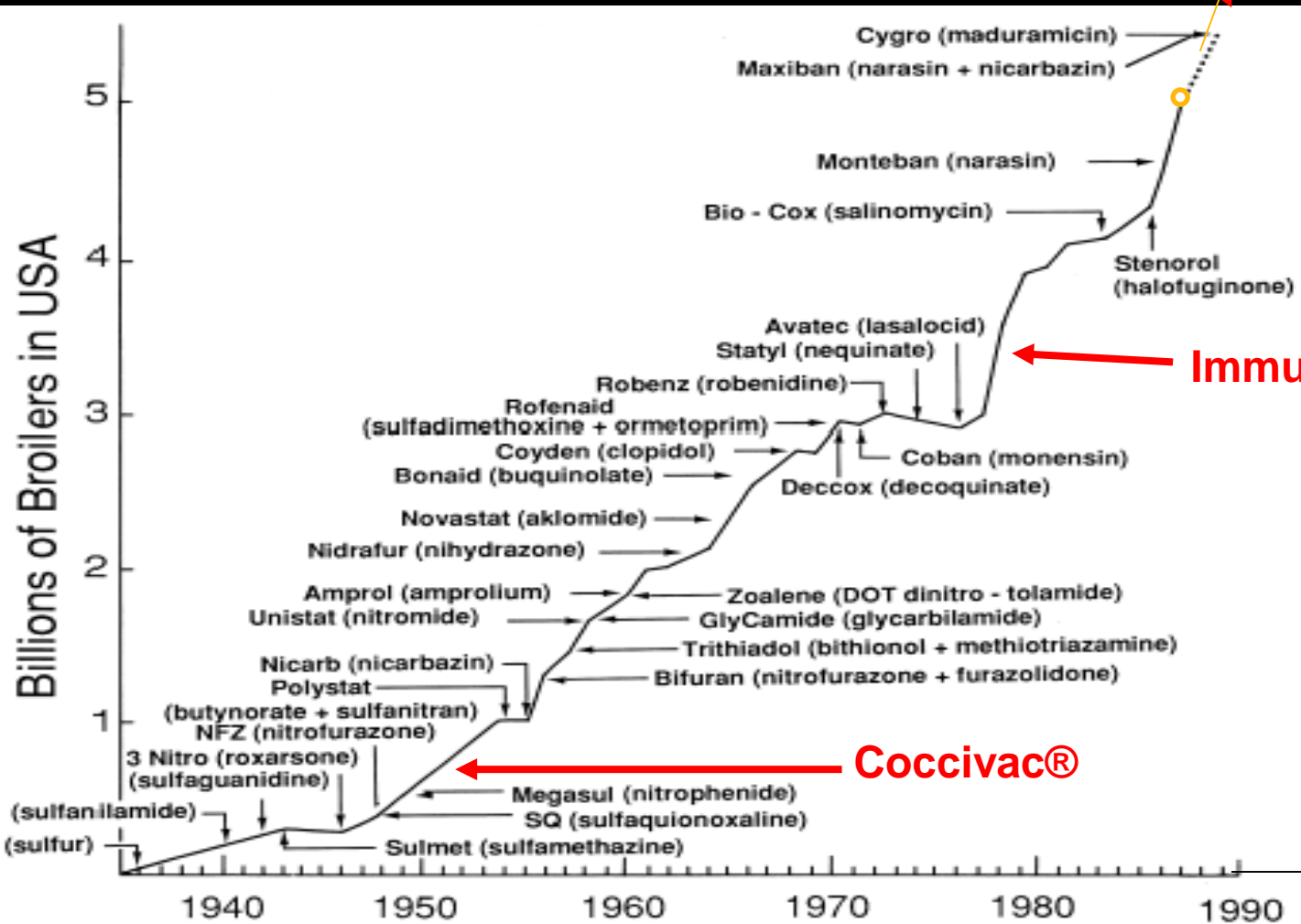
Aviax

Inovocox®
HatchPak III

Advent®

Immucox®

Coccivac®



Antibiotic Free Program

- Coccidia vaccine alone
- Coccidia vaccine with chemical
- Chemical coccidiostat
- Natural anticoccidials alone or with coccidia vaccine

Program for Loss of Coccidiostat Sensitivity

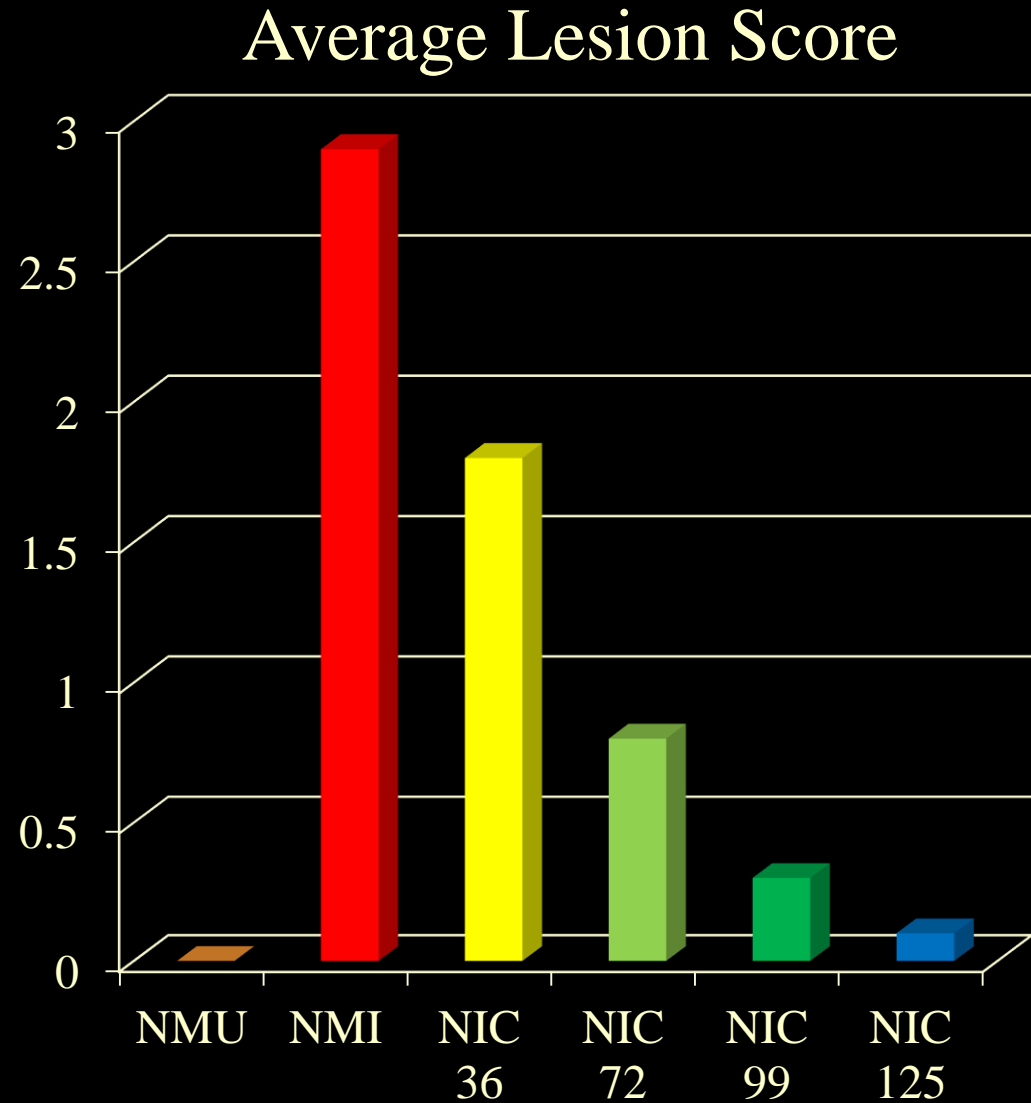
- Increase dose of coccidiostat
- Rotation and shuttle program
- Restore sensitivity by use of coccidia vaccine
- Use of coccidia vaccine with ionophore or chemical

The anchor for both ABF and loss of sensitivity?

Nicarbazin

Nicarbazin

- Approved in 1950's.
- Broad spectrum, low resistance (presently)
- Nicarbazin potentiates the anticoccidial activity of ionophores

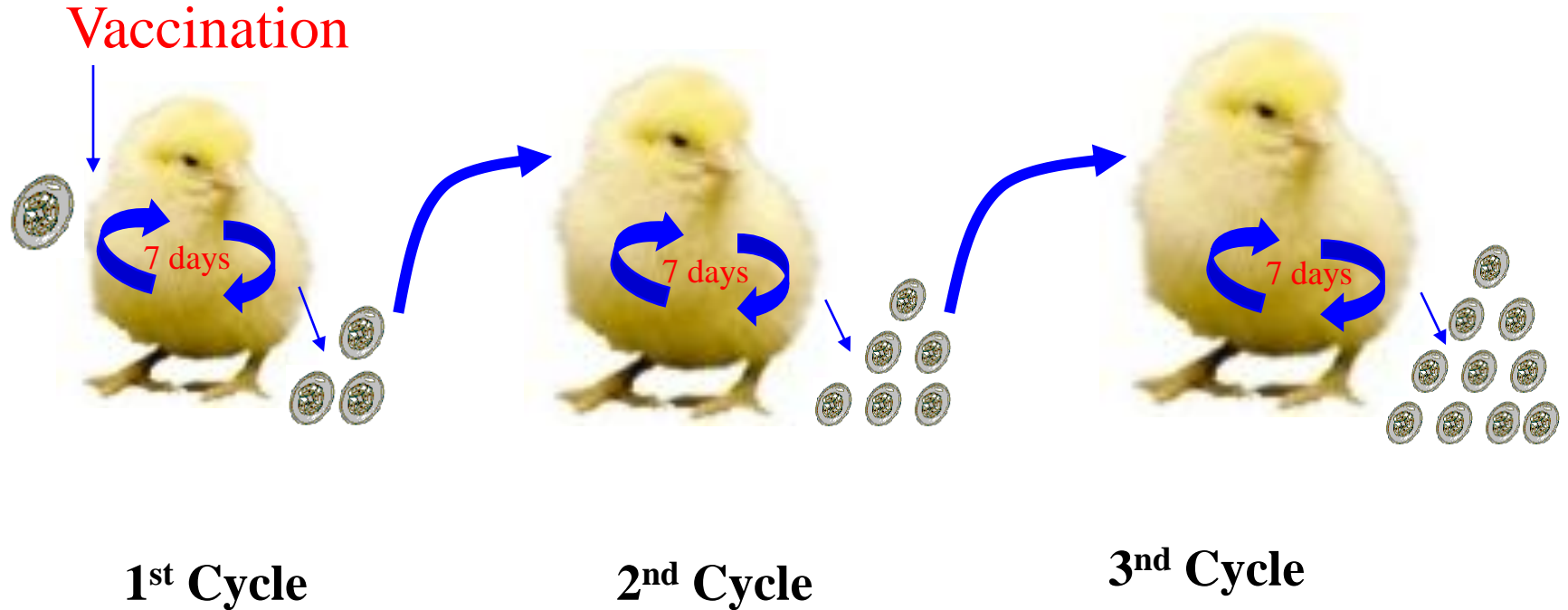


Life Line for ABF and Loss of Sensitivity

Coccidia vaccines

RECYCLING (RE-INFECTION)

Ceva slide



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Increase in Immunity with repeated recycling

Issues with *Coccidia* Vaccine

- Every chick must get a dose
- Load of pathogenic field strains
- Effects of vaccine on performance of smaller birds
- Viability of sporulated oocysts

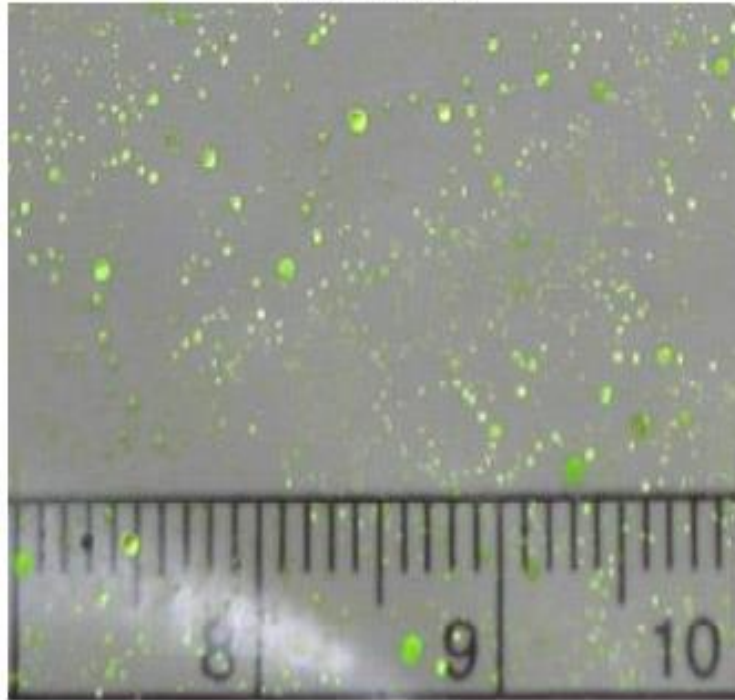
Methods to Apply Coccidia Vaccines



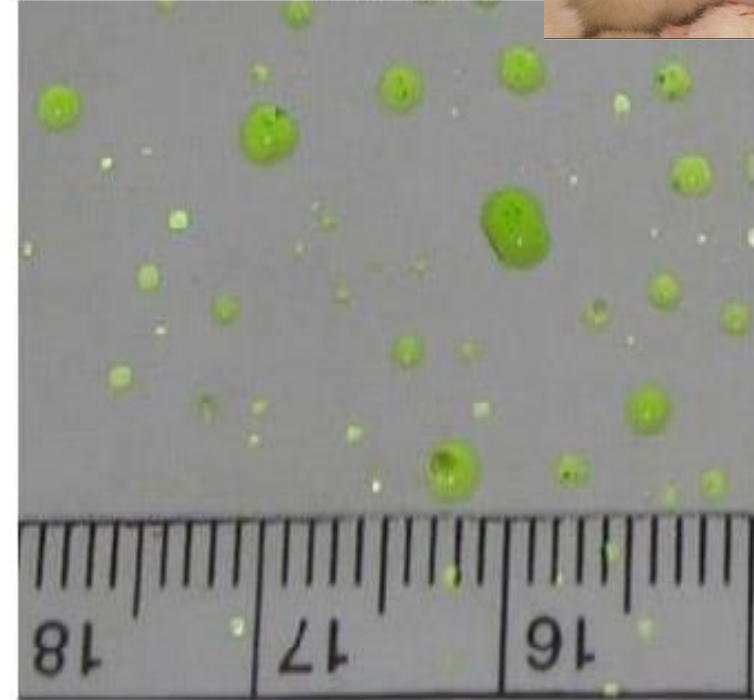
Gel Spray



Water Spray



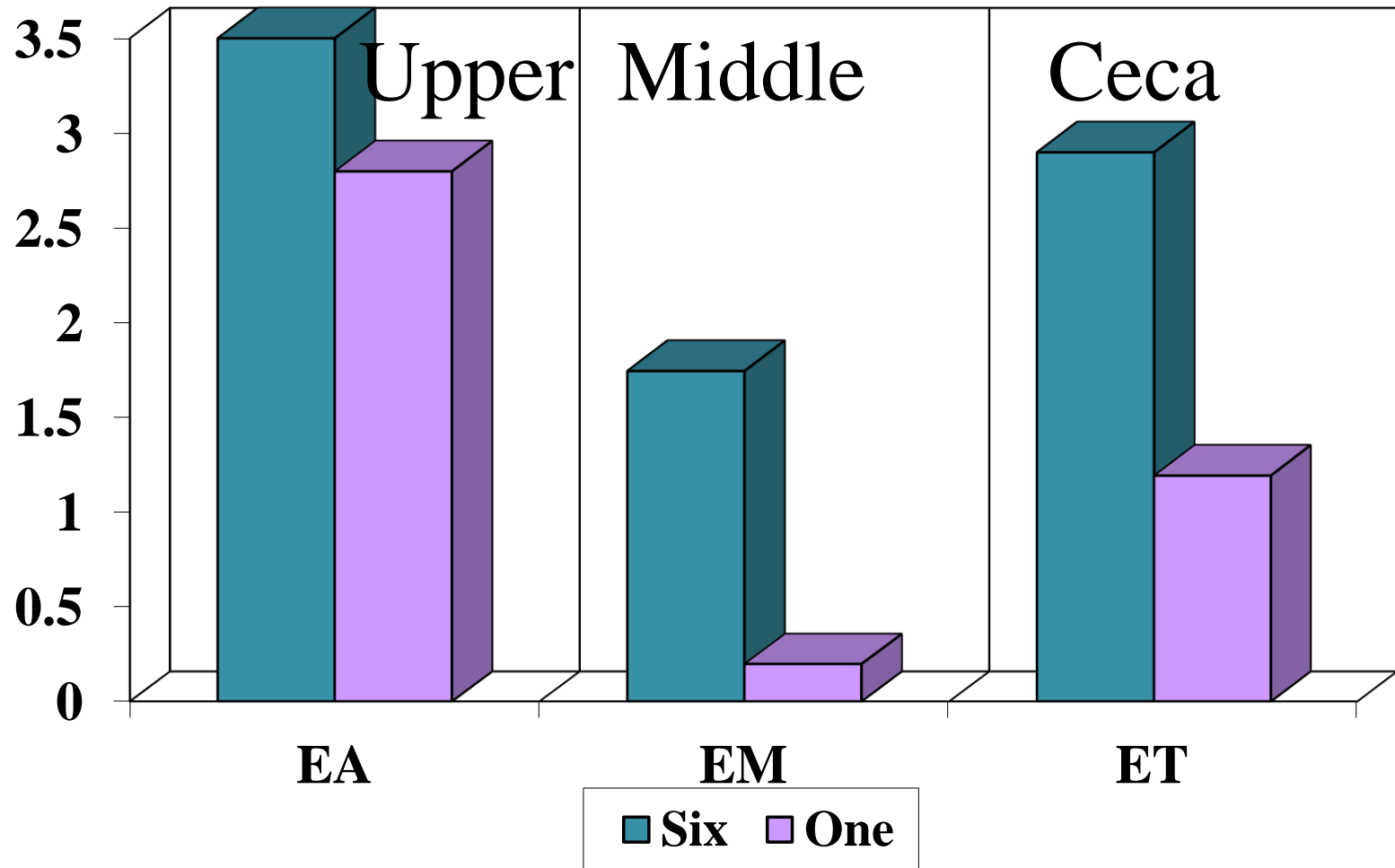
Gel Spray



The gel droplets are ingested in 2 to 3 minutes. Oocysts suspended in the gel droplets will remain multivalent.

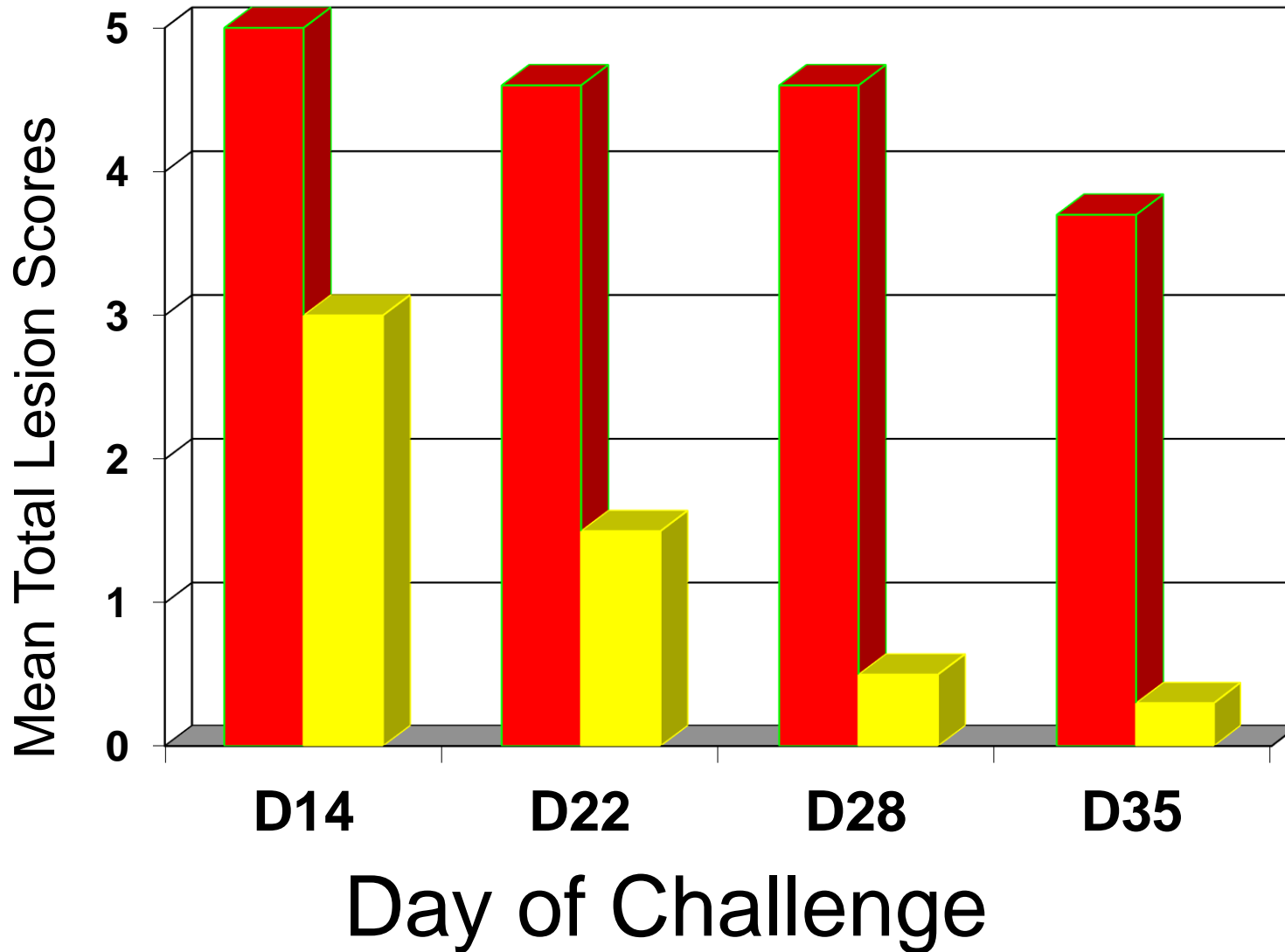
Vaccine

(six months before vs one month past expiration)



Vaccine and Coccidiostat

Immunity development with a coccidiosis vaccine



The Future **Maybe**:

Natural Anticoccidial Compounds

- Saponins (destabilize parasite cell membrane)
- Essential oil (i. e. Oregeno)
- Combination of saponins and essential oils
- Other natural compounds?
- With vaccines?

Today and Future Cocci Management

