Considerations for Antibiotic-Free Production

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and

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Southern **Poultry** Research Group

SPRG

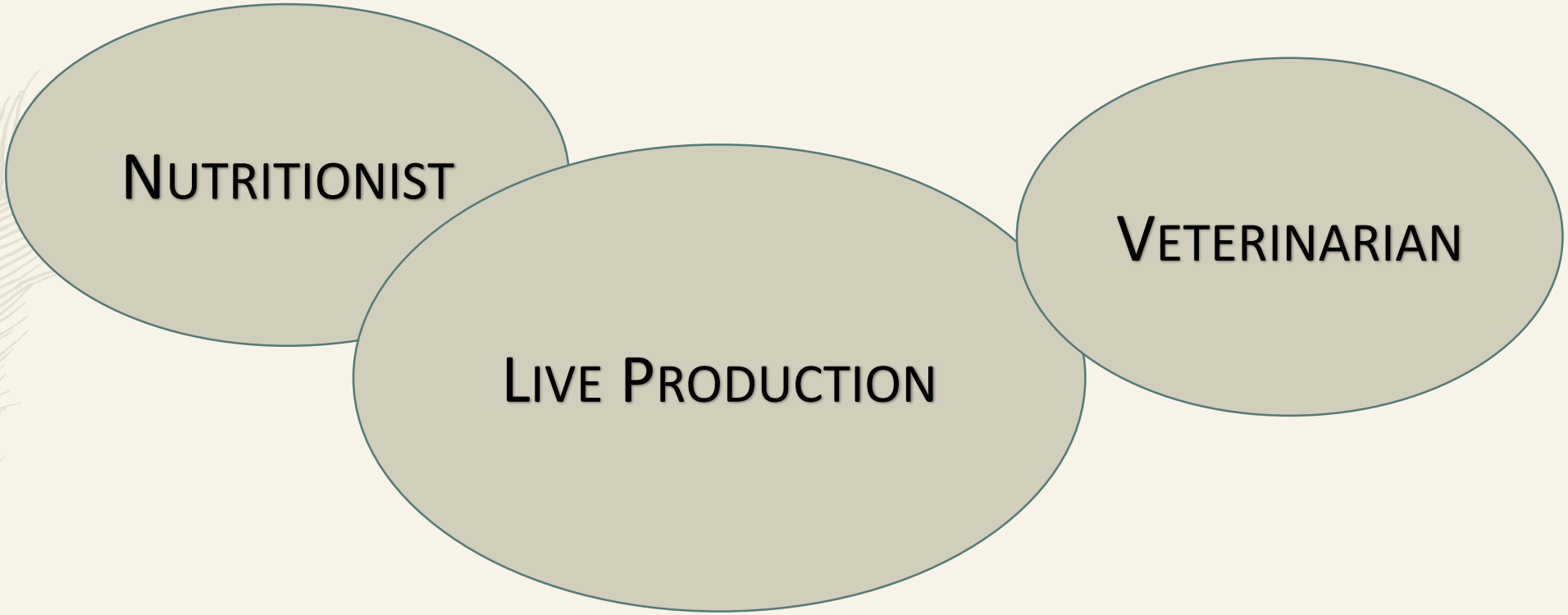
Pre-Antibiotic Free Management

Nutritionist

Veterinarian

Live Production

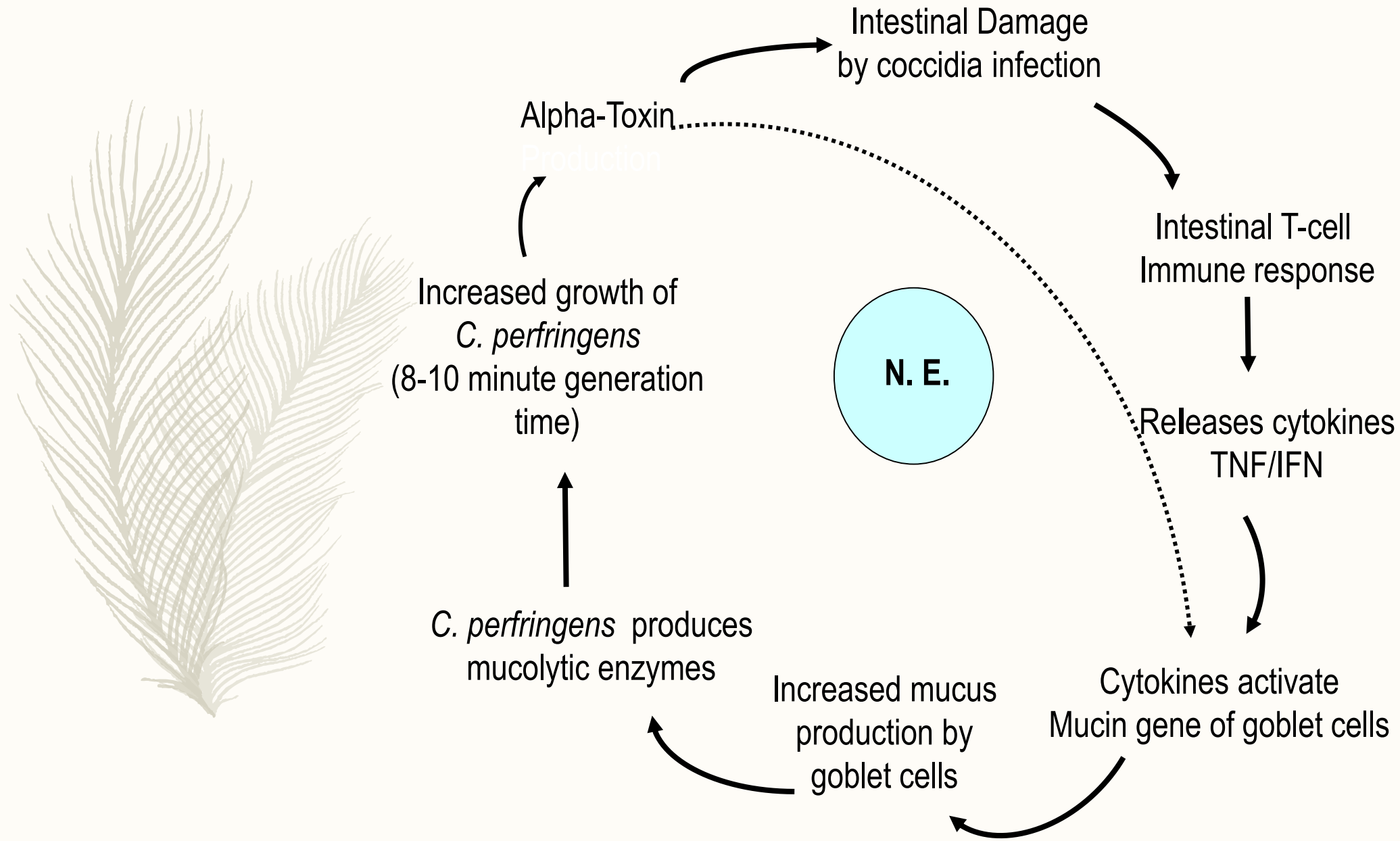
Antibiotic-Free Management



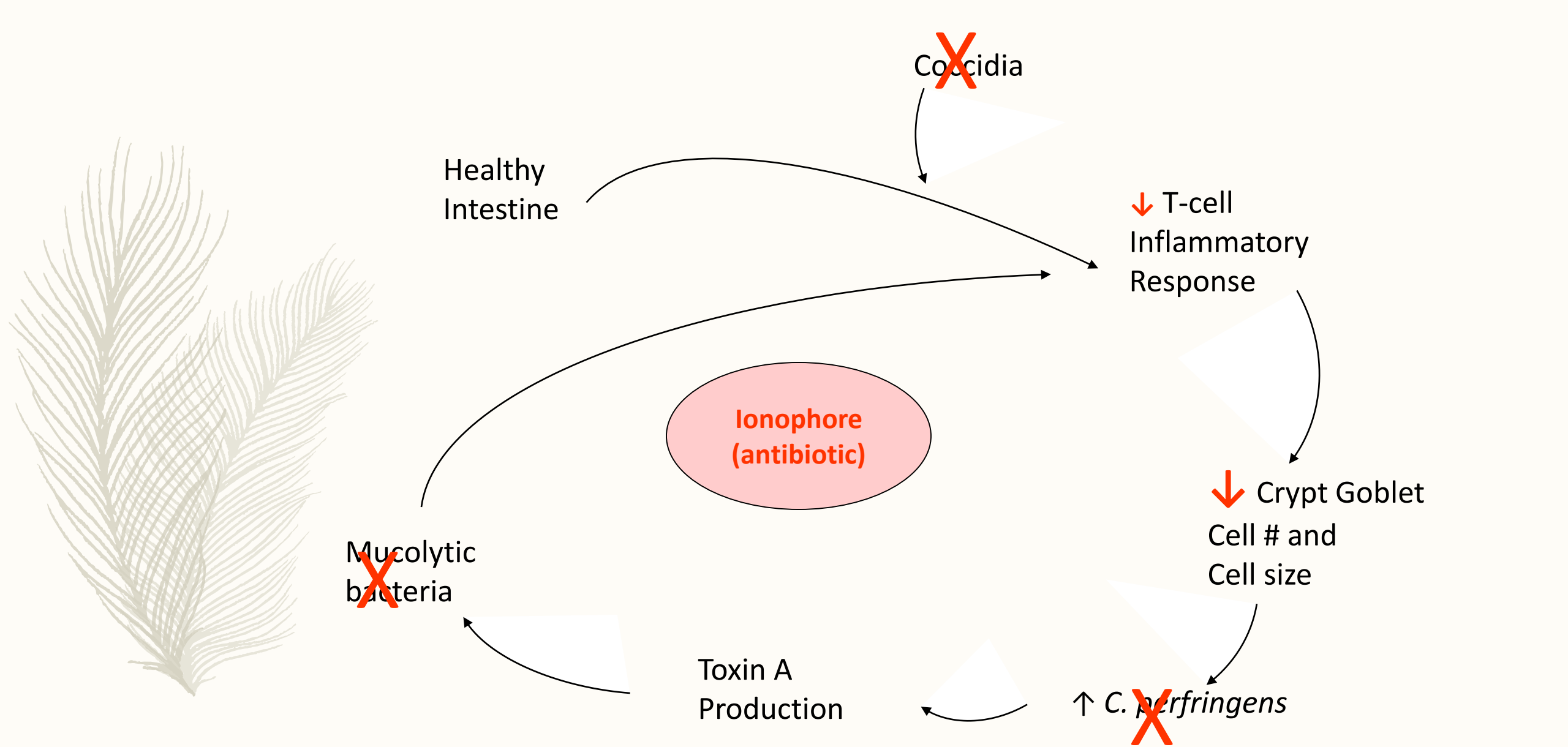
Also Human Medically Important

GUIDING PRINCIPLES

- Ingredient quality crucial
- Feeding program is critical
- Control *Eimeria maxima*
- Maintain healthy gut flora
- Reduce bacteria and virus load in flock



Collier, et al. Vet Inf & Immun. 122:104-115. 2008


Coccidia
Healthy Intestine
↓ T-cell Inflammatory Response
Ionophore (antibiotic)
↓ Crypt Goblet Cell # and Cell size
Mucolytic bacteria
Toxin A Production
↑ C. perfringens

Clinical N.E.

Mortality

Morbidity

Subclinical N.E.

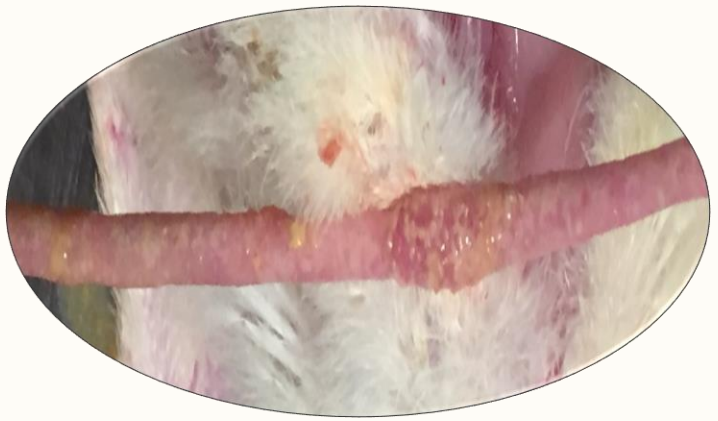
Reduced weight

Reduced growth rate

Impaired FCR

My Experience

- 1st grow-out is your best - House flora??
- Chick quality is critical
- N.E. more sever in wetter times (winter in U.S.)
- Greater square footage



My Experience

- Poorer managed farm = more N.E.
- When clinical N.E. occurs, often not all houses affected
- Clean/new litter is a **huge** risk factor
- Coccidia vaccine – 16.3 days of age (J. Smith)
- 14 day – downtime minimum

Feeding Program

- Feed changes at wrong time – Based on cocci control

-18 days o.k. for vaccine program

- Higher protein early = higher N. E.
- Want highly digestible protein early
- Welfare programs may clash with ABF

-i.e. 6 hours continuous darkness??

- Phytase and rickets??

Feeding Program

Subclinical N. E. can lose 4 points (1.66 to 1.70/3.25kg)

- Feed passage up to 15% is normal,
  starts in second feed
- All veg diet – a problem ? ?

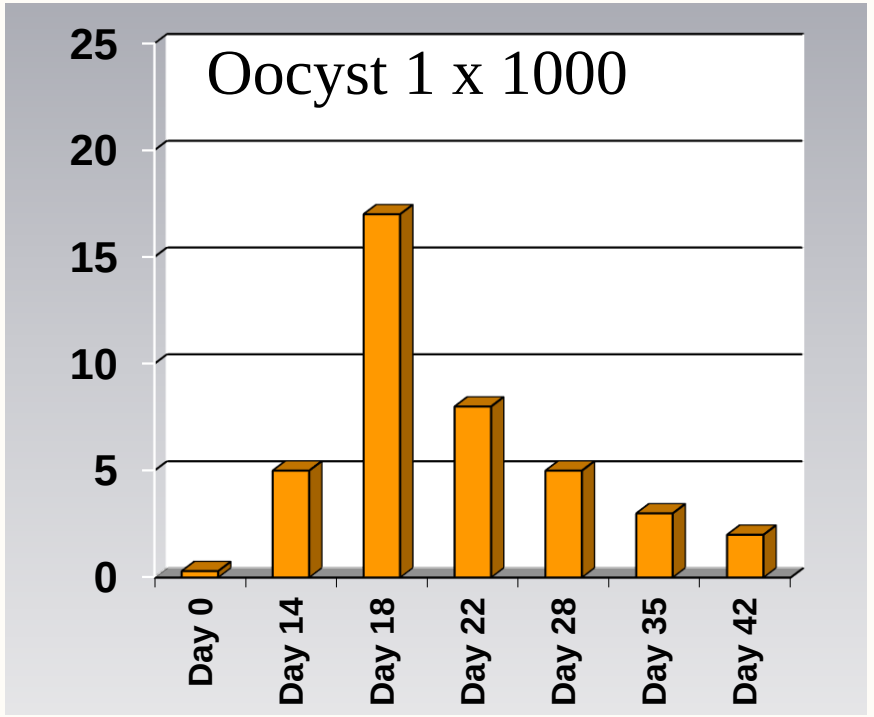
Control Intestinal Epithelium Damage

(Good Gut Health)

- Ingredient quality
  - Mycotoxins
  - Biogenic amines
- Coccidia Control
  - Vaccines
  - Chemicals
  - Both (Bioshuttles)

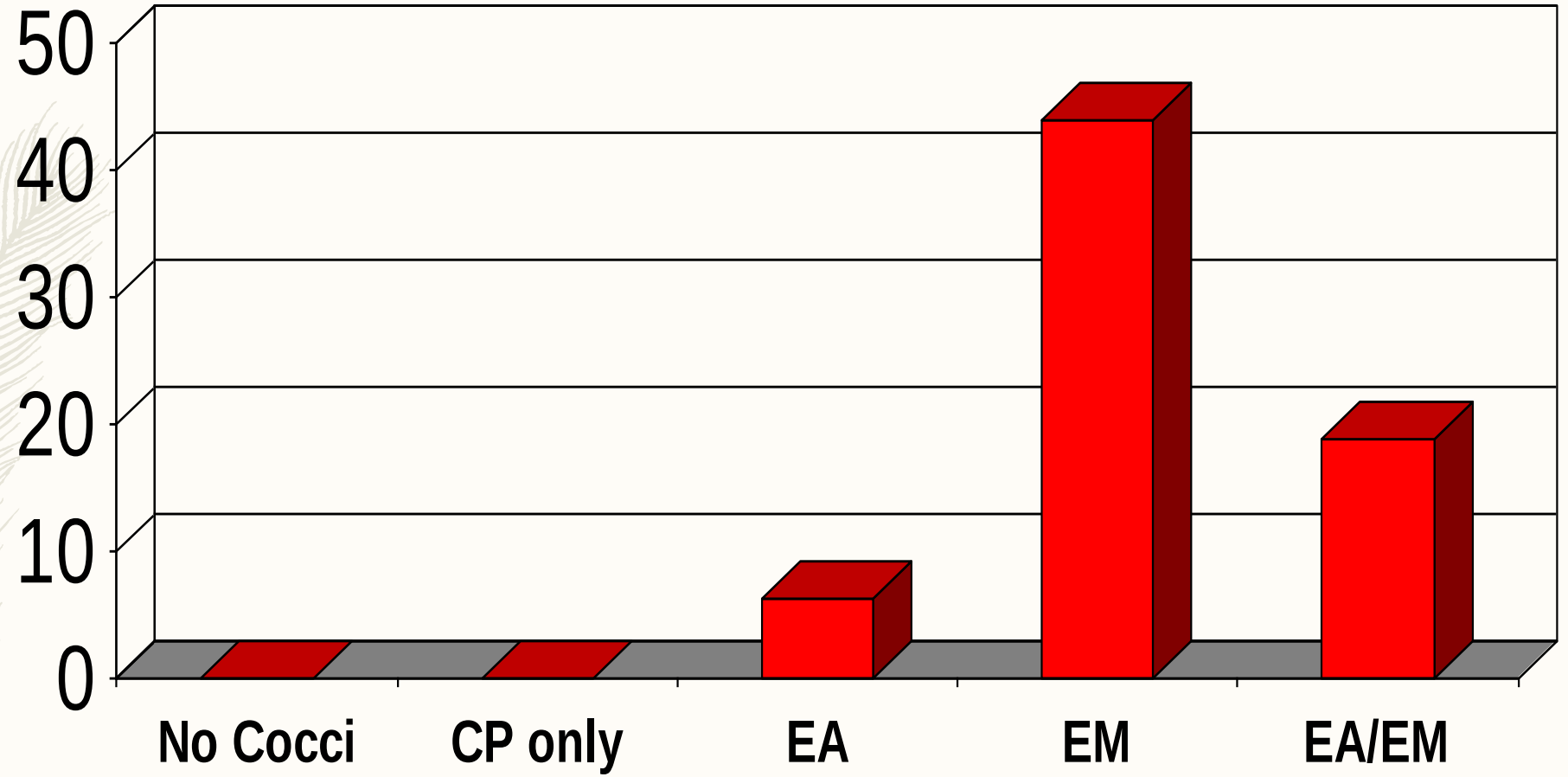
Oocyst Shedding Pattern following Coccivac-B Vaccination

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



Hofacre 2018 P.S. 97:1929-1933

% Necrotic Enteritis Mortality



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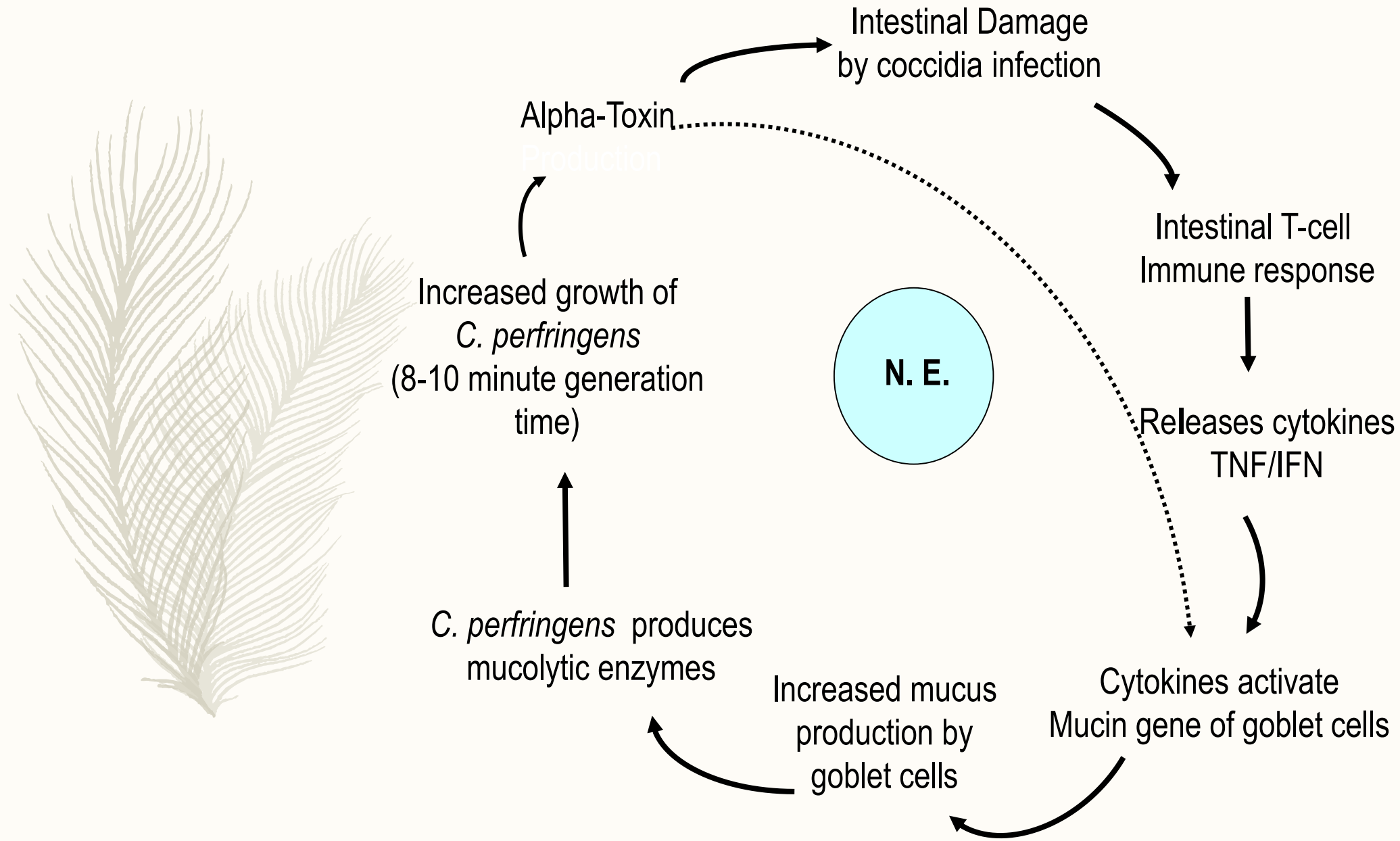

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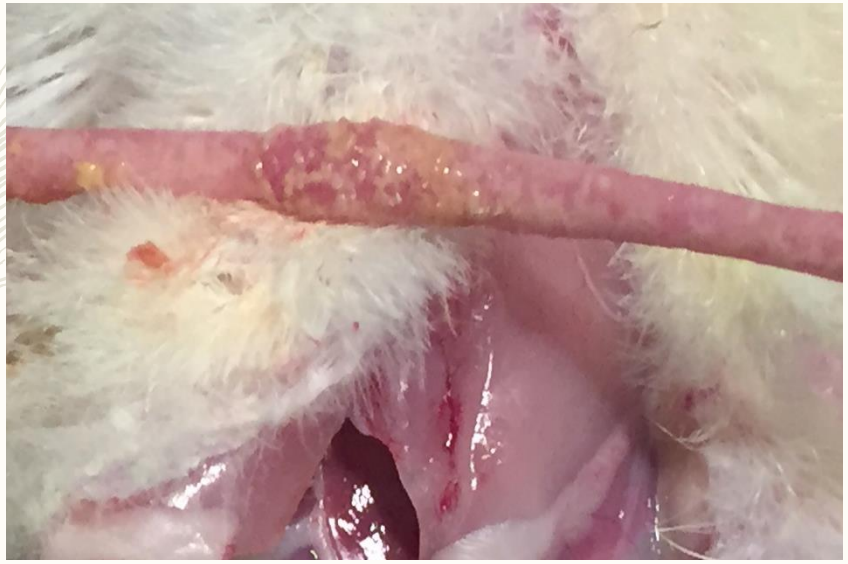
Cocci Control



- Vaccines in U. S.
  - Coccivac™, Advent™, Inovocox™, Hatch Pak™
  - *No difference in NE incidence
- 2 doses – Hatchery and spray litter??

- *E. maxima* takes are the problem
- Combine vaccine and chemical coccidiostat in Bioshuttle
- Need at least 1 cocci cycle

Bird Health = Gut Health

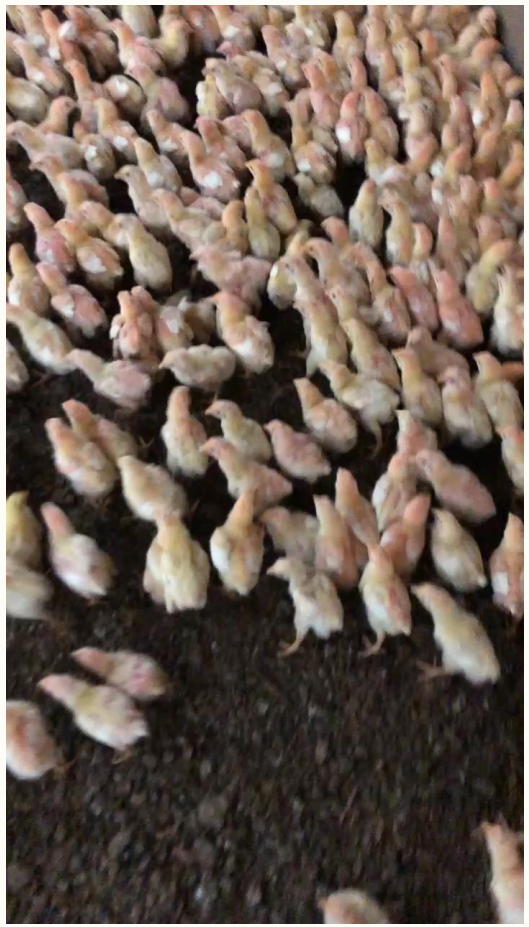
(Number of Cases January 2016 – March 2016)

• Chick Quality	14%
• N. E./Cocci	27%
• Respiratory	13%
• GD	12%
• IBH	7%
• BCO	5%
• Unknown	10%

Bird Health = Gut Health

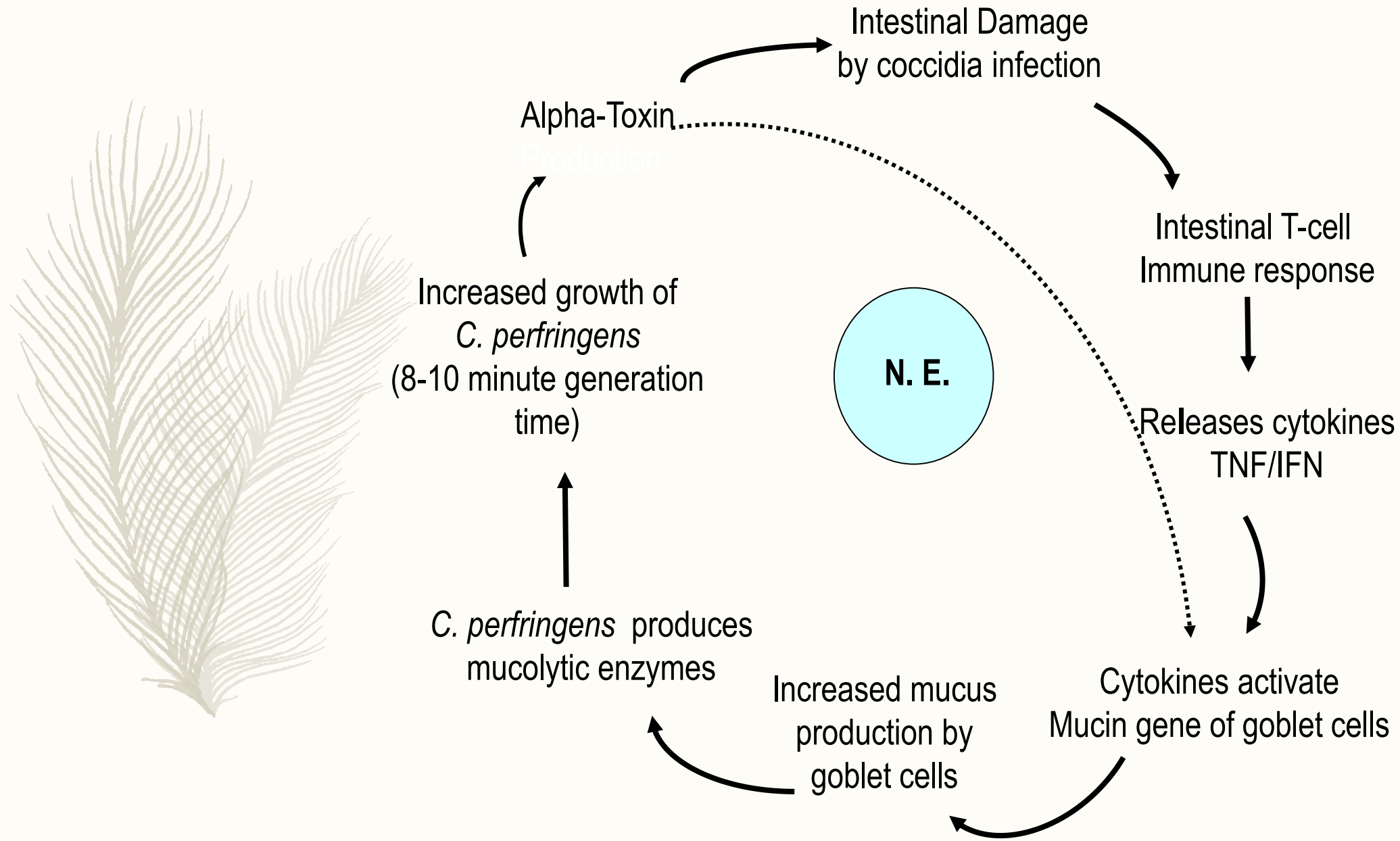
1. Egg Pack is critical
2. Chick Quality is critical
3. If 1 & 2 perfect without Gentamicin 0.5%
   higher first week
4. If 1 & 2 less than perfect → Happy at 3.5%
   average first week

Minimize Self Induced Disease



Viral Vaccine Reactions

- Minimalist approach to IBV and NDV vaccines
- Maintain good immune system health
  - Breeder IBDV/CAV vaccination
  - Broiler IBD vaccination ? ?



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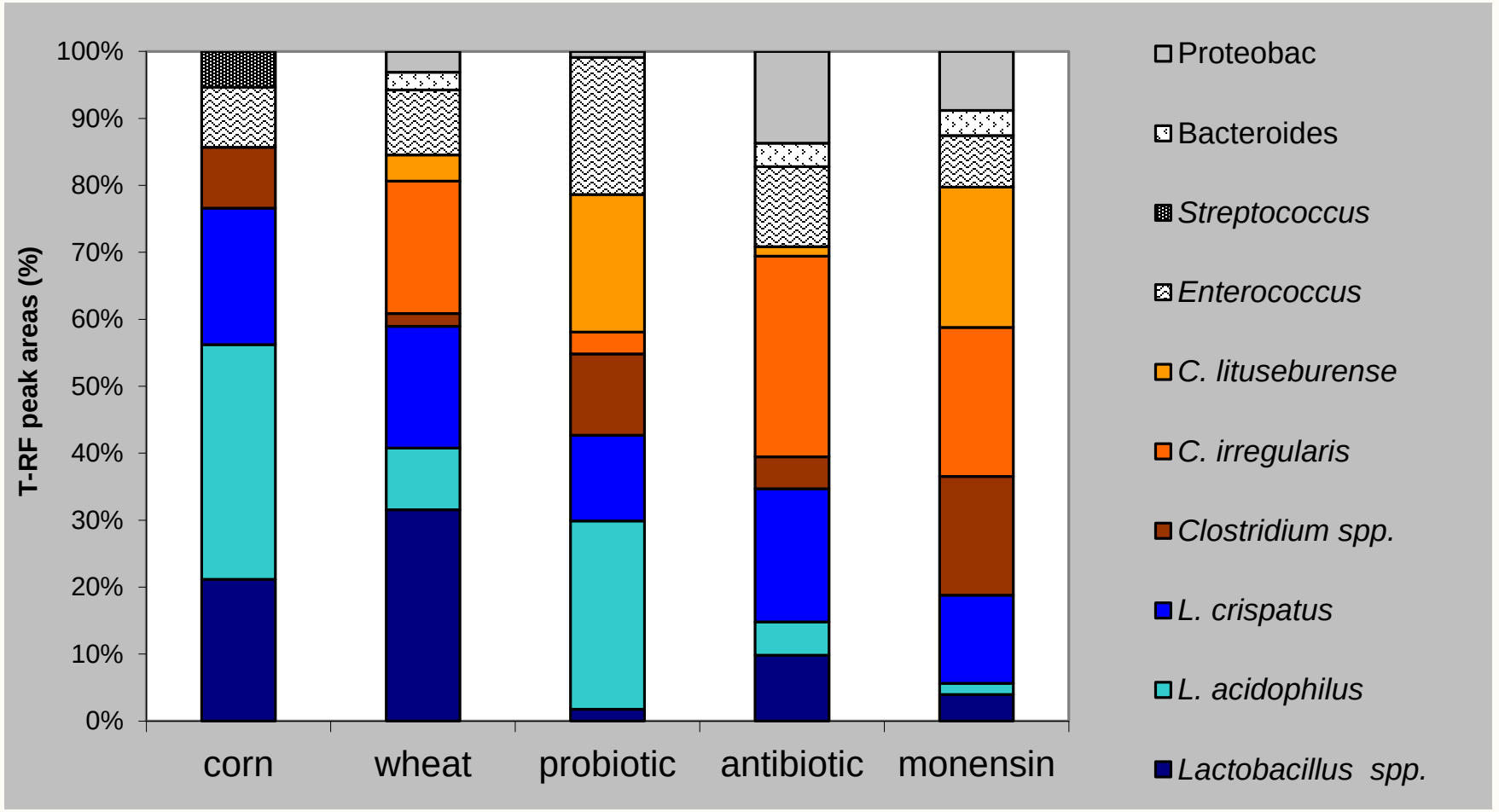
CLOSTRIDIUM PERFRINGENS

- Soil organism
- Anaerobe forms highly resistant spores
- Normal flora
- Alpha, beta and Net B toxins
- Toxins or digestive enzyme??

Bacteria composition of the Ileum



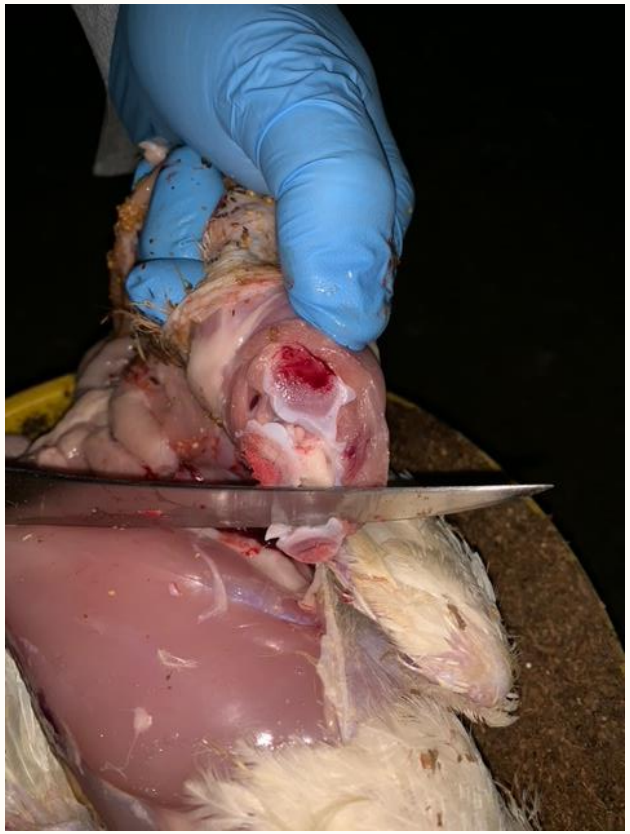
PREVENT NECROTIC ENTERITIS

1. *Control intestinal epithelium damage*
   - ingredient quality
   - Coccidia
2. *Prevent toxigenic strains of C. perfringens from multiplying*
   - Ingredient types
   - Use of enzymes
3. *Maintain Healthy Intestinal Microbial Flora*

Train Service Techs to Post Birds

"It looked like gelatin inside the intestine." *Service Tech*

Train Service Techs



Rickets

- Malabsorption?

Osteomyelitis

and

“Kinky Back”

Water Treatment Program

- Water disinfectant
- Aspirin
- Mucolytic
- Antibacterial
    - Phytogenic
    - Short/medium chain fatty acids
- Coccidia control
    - Amprolium
    - Saponins
    - Essential oils

N.E. Interventions Tested That Work:

- Enzymes i.e. Phytase, Amylase, etc.
- Prebiotics (MOS)
- Probiotics (Defined/undefined)
- Organic acids
- Inorganic acids
- Phytoceuticals (essential oils, Saponins, etc.)
- Immune stimulants/modulators
- **Combination of above**

TEAM = "A GROUP ON ONE SIDE."

WEBSTER'S NEW COLLEGIATE DICTIONARY

Partner with Growers!